NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

CrossComm gives SNA a high priority

By Maureen Molloy
Senior Writer

MARLBOROUGH, Mass. — CrossComm Corp. is prepping new software for its ILAN bridge/router that promises to improve its performance and reliability in handling SNA — issues that have kept many users from folding SNA data onto multiprotocol internets.

ILAN Release 5.04 software, scheduled to be announced late next month, will let the bridge/router emulate key properties of an IBM PU 4 node. They include Systems Network Architecture's Class of Service, which lets users establish priority levels for SNA traffic, and transmission groups, which enable users to predefine alternate paths between devices.

Cisco Systems, Inc. is also expected to announce this week products that address SNA Class of Service and transmission groups. Although further details were not available, the products are expected to put teeth into Cisco's five-phase plan for assimilating SNA into multiprotocol backbones ("Cisco to flesh out SNA

PHOTO ©1992 AP/WIDE WORLD PHOTOS, INC.

A resident of Homestead, Fla., which was hit hard by Hurricane Andrew, ponders the devastation left in the deadly storm's wake.

Windows aims to dominate the network, top to bottom

By Margie Wylie
Senior Editor

SAN FRANCISCO — As part of its bid to capture the LAN market through its Windows desktop operating system, Microsoft Corp. last week demonstrated Windows NT running on a 16-processor server and started preparing to ship Windows for Workgroups — with previously undisclosed features — in October.

Sequent Computer Systems, Inc. and Microsoft showed off a version of the multithreaded 32-bit Windows NT running on a

Symmetry 2000/750 server with 16 50-MHz Intel Corp. i486 processors. That makes Windows NT, which incorporates Microsoft's LAN Manager network operating system (NOS), the second LAN operating system with demonstrated symmetrical multiprocessing capability.

Banyan Systems, Inc. currently ships VINES SMP, a symmetrical multiprocessor version of its NOS.

Novell, Inc. never shipped its NetWare MP, a multiprocessor

Users feel the fury of Hurricane Andrew

Amid devastation and personal loss, net pros struggle to get communications back to normal.

By Jim Duffy and Wayne Eckerson
Senior Editors

With a vicious one-two punch, Hurricane Andrew smashed the southern U.S. last week, causing unparalleled destruction and disrupting computer and network operations at scores of companies.

Andrew, which devastated southern Florida and parts of Louisiana, is believed to be the costliest natural disaster in U.S. history. The damage to Dade County, Fla., alone is estimated to be an astounding $20 billion, more than three times that of 1989's Hurricane Hugo. In its wake, Andrew left 22 dead in Florida, and about 250,000 homeless and nearly a million without electricity in Florida and Louisiana.

While the storm left residents dazed and grieving, it also wreaked havoc with businesses, leaving them without electricity and network facilities. Packing winds that peaked at over 160 miles per hour, Andrew ripped

the roofs off telephone switching centers, twisted or leveled cellular radio towers, blasted through windows and walls in office build-

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FEATURES

■ **Buyer's Guide** puts LAN and WAN analyzers under the microscope. Page 35.

■ **Network Security Test Series** probes the innerworkings of Intel's LAN-Protect for protecting servers from virus attacks. Page 45.

Insurer adds phone fraud protection

By Bob Brown
Senior Editor

HARTFORD, Conn. — The Travelers Corp. last week invited corporate network users under its umbrella of protection with the introduction of the first broad insurance policy designed to cover losses from toll fraud.

The Travelers' Remote Access Toll Fraud Policy, which covers losses up to $1 million a year, addresses a growing problem that experts claim costs U.S. businesses more than $2 billion annually.

The Travelers' policy comes on the heels of toll fraud protection plans offered by several other sources. In March, Aetna Life and Casualty Co. unveiled a policy for banks that covers losses due to toll fraud and other technology-oriented crimes.

NETLINE
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IBM ASKS USERS to cough up an extra 3% to 5% under new pricing for most hardware and software products. Page 2.

INDUSTRY'S FIRST global standard for interoperability among imaging systems is set for review. Page 2.

FLORIDA ROLLS ITS own custom network management system that will be made available

to others. Page 4.

ORACLE EXTENDS REACH of its SQL*TextRetrieval to more data sources. Page 4.

NETFRAME, ORACLE JOIN forces to build multiprocessing DBMS for NetWare. Page 5.

NTI UNVEILS RISC-based ACD management system with new customizable GUI. Page 5.

New AT&T PRI option may boost popularity of ISDN

Enables consolidated access to array of services.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Bowing to pressure from major customers, AT&T next month will begin offering a new ISDN PRI access option that could make the service attractive to a larger group of users.

> AT&T cuts price for SDDN Switched 384, discounts ISDN PRI service. Page 4.

Primary Rate Interface-Static Integrated Network Access (PRI-SINA) will let users access switched voice services, as well as switched and dedicated data offerings, through a single PRI line.

Today, AT&T customers cannot use PRI for that type of con-

solidated access. That has kept large users from employing PRI at all but their biggest sites and precluded small and midsize firms from implementing Integrated Services Digital Networks.

"We saw strong user demand for PRI-SINA and a great opportunity to make PRI available to the masses," said Richard Campbell, AT&T's ISDN product manager.

Added Ed Hodgson, manager of computing and communications services for Schindler Elevator Corp., an ISDN PRI user, in

Standards bodies converge on worldwide imaging spec

Image Processing and Interchange standard promises to put an end to the 'Tower of Babble.'

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — National and international standards bodies next month will complete the first review of a draft standard that would allow users to exchange image data among imaging systems from a variety of vendors.

The Image Processing and Interchange (IPI) specification is the first imaging standard put forward on a global basis. It promises to bring a common language to a market that analysts today describe as a "Tower of Babble," owing to the dozens of proprietary formats in use.

Designed with input from about two dozen vendors worldwide, including Eastman Kodak Co., IBM and Sun Microsystems, Inc., IPI is designed to include the most advanced features in imaging today.

IPI would allow users to send sequences of still images to create the effect of movement. Users could also extract data from images for separate transmission across a network and manipulate images or the data objects extracted from images for enhancement or restoration.

Molson puts client/server architecture into its brew

Brewery dumps mainframe for internetwork.

By Skip MacAskill
Staff Writer

TORONTO — In an effort to centralize net management, reduce costs and increase productivity, Molson Breweries last week said it has begun migrating from a mainframe-based SNA net to a client/server architecture.

Molson, Canada's largest brewing company and North America's oldest brewery, announced it has tapped Bytex Corp. to supply it with 70 Series 7700 intelligent switching hubs, which, along with Cisco Systems, Inc. routers, will serve as the foundation for a new token-ring

internet that is key to the client/server strategy.

The migration, which is expected to take place over the next 12 months, is part of Molson's effort to remain competitive with U.S. brewers when trade barriers between the two countries are lifted next fall.

"We're undertaking this migration to react to changes in the industry, government regulations and distribution channels more quickly," said Allen Gates, director of operations and technical support at Molson. "In a client/server architecture, we'll

Users troubled about price increases on IBM products

By Michael Cooney
Senior Editor

ARMONK, N.Y. — 'Tis the season to grin and bear it.

IBM last week increased both onetime and monthly charges on most of its software products by 5% and hiked hardware prices by 3% (see graphic, page 6).

The increases hit large Systems Network Architecture shops particularly hard since most of them have expensive VTAM, Network Control Program and NetView software leases to contend with, not to mention the mainframe that anchors the net. The increases mean thousands of dol-

lars in extra costs to those users.

While IBM calls the price increases part of its "normal business review," analysts said the company is trying to modestly increase prices without slowing user demand, a balancing act that is increasingly hard to perform in a shaky economy that has users trying to do more with less.

"Nobody likes to pay more," said Peter Burris, an analyst with International Data Corp., a market research firm in Framingham, Mass. "Especially if they're not getting more in return."

Most users concurred with that

Briefs

Bill me now or not at all. Ameritech last week announced it will institute a "timely billing guarantee" on the nonrecurring and monthly switched and special access charges that Ameritech's local carriers charge long-distance carriers. Starting Sept. 1, Ameritech will not bill customers for access charges that are more than 90 days beyond the date when they should have been billed. Ameritech said it is the first Bell company to respond to long-haul carrier requests for this service.

OSF taps Systems Center. The Open Software Foundation, Inc. (OSF) last week selected Systems Center, Inc. of Reston, Va., to provide the Distributed Print Services component of OSF's Distributed Management Environment (DME). Systems Center will upgrade Palladium, which is standardized print code developed by the Massachusetts Institute of Technology, for use in the DME. By the second half of 1993, the firm will provide to OSF the user interface, print supervisor, print spooler, base code, documentation and an application program interface for inclusion in DME Phase 2.

GTE goes ATM. GTE Government Systems Corp. last week unveiled an Asynchronous Transfer Mode (ATM) switch said to integrate voice, data, video and images over 155M bit/sec wide-area links. With a bus speed of 1.2G bit/sec, the Secure Prioritized ATM Network (SPANet) switch supports eight ports for attaching Ethernet and Fiber Distributed Data Interface local-area networks to T-1 and T-3 network services and, later, to Synchronous Optical Network services. A five-node SPANet network is being installed at Griffiss Air Force Base in Rome, N.Y. SPANet is priced at $8,000 per port and is available now.

AT&T pack supports voice/data link. AT&T Network Systems last week announced Link 1, central office switch software that will enable local exchange carriers to integrate central office-based automatic call distributor services with computers at user sites. The software will enable telephone companies to deliver the phone numbers of calling parties to users, which will enable them to integrate voice and data for telemarketing applications. AT&T Network Systems will make Link 1 generally available to telephone companies in November.

GEIS gets goods through customs. Value-added network provider GE Information Services, Inc. last week announced the availability of Cargo*Link/Customs Connections, a direct communications link into the U.S. Customs Automated Air Manifest System intended to help importers electronically expedite goods through customs. Traders using approved software can use the Automated Air Manifest System to fill out air waybill information, update air manifest data and receive clearances from customs for delivery of freight upon arrival.

Vendors form voice messaging group. In an effort to promote the efficient use of their products, leading voice messaging system and service providers last week formed the Voice Messaging Education Committee (VMEC). VMEC will develop guidelines for effective voice messaging management and use, identify successful applications, and offer implementation and training programs. VMEC founders include AT&T, Centigram Communications Corp., Digital Sound Corp., Northern Telecom, Inc., Nynex Corp., Octel Communications Corp., Siemens/Rolm, Tigon Voice Messaging and VMX, Inc. For more information or to join the group, contact Vanguard Communications Corp. at (508) 897-1986.
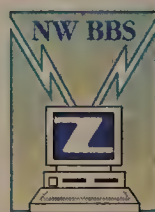
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Florida at work on custom mgmt. system for state net

Unix-based system will monitor voice, data links.

By Bob Brown
Senior Editor

TALLAHASSEE, Fla. — Unable to find an off-the-shelf system that could effectively manage its growing multivendor net, the state of Florida is working with a systems integrator to build a customized platform that will later be made available to other users.

The specially designed system will support SUNCOM, a voice, data and video network serving state and local government offices and social service agencies in the Sunshine State.

The management system, which is scheduled for completion next August, will serve two basic functions, said Glenn Mayne, director of the Division of Communications for Florida's Department of Management Services. It will be used to gather operational alarms for voice, data and video circuits, as well as collect call detail data for chargeback.

The management system has been designed to exchange information with existing systems housed at Florida's Network Control Center here. It will work with an existing directory and agency database on a Unisys Corp. mainframe, data network control and billing software on an IBM mainframe, and a circuit inventory system on an IBM Token-Ring local-area network.

Cincinnati Bell Information Systems, Inc. (CBIS), the systems integration arm of Cincinnati Bell, Inc., has been awarded a five-year, $4.6 million contract to develop the management system.

Florida received input from a handful of other states in assembling its request for information for the net management system, and five other states have already discussed with CBIS the possibility of buying a similar system.

Florida's SUNCOM net provides transport services through statewide digital central offices supporting Centrex. The switches are interconnected via leased fiber-optic transmission facilities.

SUNCOM takes advantage of the digital local loops that are available in most areas of Florida to provide end-to-end digital connectivity to agency locations. It also supports a handful of private branch exchanges at various government agencies and an IBM Systems Network Architecture net.

State engineers investigate and repair circuit problems re-

AT&T to cut SDDN rates, set up ISDN discount plan

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week proposed a 25% across-the-board price reduction on its Software-Defined Data Network (SDDN) Switched 384 service and the first discount plan

Today, an SDDN Switched 384 call of any length costs almost the same as using six switched 64K bit/sec links. If the proposed cuts are approved, companies could use SDDN Switched 384 for the same price of 4½ switched 64K bit/sec links.

AT&T slashes SDDN rates by 25%

Mileage band	Old		New	
	First 18 sec or less	Each additional 6 sec or less	First 18 sec or less	Each additional 6 sec or less
0-55	$0.5988	$0.0396	$0.4491	$0.0297
56-292	$0.6060	$0.0420	$0.4545	$0.0315
293-430	$0.6762	$0.0654	$0.5073	$0.0491
431-925	$0.7032	$0.0744	$0.5274	$0.0558
926-1,910	$0.7302	$0.0834	$0.5478	$0.0626
1,911-3,000	$0.7518	$0.0906	$0.5640	$0.0680
3,001-4,250	$0.8058	$0.1086	$0.6045	$0.0815
4,251-5,750	$0.8058	$0.1086	$0.6045	$0.0815

* Daytime rates for Software-Defined Data Network 384K bit/sec calls originating and terminating at on-network locations using switched digital access.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: AT&T, BASKING RIDGE, N.J.

for ISDN Primary Rate Interface (PRI) service.

Analysts said the rate cut will make the already popular SDDN Switched 384 service even more attractive, while the discount plan is designed to build interest in ISDN, for which major user demand has yet to materialize. SDDN Switched 384 is widely used for videoconferencing, local-area network interconnection and imaging.

and network design firm, said the rate cut would change the economics of net engineering (see graphic, this page).

The cost of a typical 30-minute SDDN Switched 384 call between two sites in the 0-55 mileage band would drop from $12.44 to $9.33, while the same call in the 431-925 mileage band would drop from $22.95 to $17.21.

The cost of a switched 384K bit/sec call in the 4,251-5,750 mileage band would slide from $33.28 to $24.96

Selling SDDN Switched 384 has been a breeze. But observers said AT&T has had a harder time marketing ISDN PRI, although the carrier claims it has been adding several sites a day for more than a year — a pace AT&T said has exceeded its expectations.

In August 1991, AT&T launched a promotion that offered users three months of free PRI service — waiving the service's onetime installation and monthly charges.

Now one year later, AT&T is again offering ISDN deals, this time proposing its first ISDN PRI discount plan, which slashes the service's installation and monthly charges.

"The discount plan is a strong indication that AT&T is still having real problems selling PRI," said Mark Langner, an associate with TeleChoice, Inc., a Montclair, N.J., consultancy.

AT&T will waive the $3,000 per-PRI installation charge for users that order 10 or more PRIs between Sept. 1, 1992, and May 3, 1993, and have them installed within 30 days after receipt of or-

"This is great news," said Greg Casagrande, enterprise networking manager for GE Capital in Stamford, Conn. "It's a good strategy move by AT&T and a big move toward making [SDDN] Switched 384 more attractive."

GE Capital is among the first companies to implement the service, having used it since last fall.

David Durgee, a vice-president with The Aries Group/MPSG a Rockville, Md., tariff analysis

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Oracle to offer enhanced text retrieval software

By Timothy O'Brien
West Coast Bureau Chief

REDWOOD SHORES, Calif. — Oracle Corp. is expected to unveil tomorrow a new version of its SQL-based text retrieval software that offers increased performance and broader support of external data sources.

SQL*TextRetrieval V2.0 leverages the distributed capabilities of Oracle's relational database management system by adding SQL extensions that enable data and documents to be retrieved from Oracle databases or other applications across a net.

"Anything you can do in SQL and anything you can do with a text retrieval engine can now be done with this product with a single query over a heterogeneous network," said Richard Barker, senior vice-president of Oracle's European development center in Chertsey, England.

Originally developed for a client during an integration project and then released in 1988 as a product, Oracle's text retrieval offering uses an extended SQL capability to integrate text queries into standard SQL.

The software aids in text retrieval applications such as managing legal contracts, literature searches and on-line customer service functions.

The initial version of the product was too slow, and its document storage and retrieval capabilities were reliant upon Oracle databases. The new release attempts to solve these problems through faster indexing in the database and broader support of word processors and standard file formats.

In addition, Oracle is bundling the text retrieval technology into its computer-aided software engineering tools as well as its suite of business applications to provide the capability of managing all types of information — text, images, graphics as well as data.

SQL*TextRetrieval V2.0 runs on Sun Microsystems, Inc. workstations or Digital Equipment Corp. VAX computers. The previous version of the product required documents to be stored in the local database, but V2.0 can retrieve documents out of the local database, other Oracle databases across the network as well as the word processors.

The first two word processors supported are Microsoft Corp.'s Word and WordPerfect Corp.'s WordPerfect. Using V2.0, documents can also be stored and managed in ASCII and EBCDIC.

With a new technology called filters, Oracle's SQL*TextRetrieval product allows users to view the textual portion of a document even if the application that created it is not running locally.

Filters for Word, WordPerfect and DEC's All-In-1 product come with V2.0. In addition, an open interface is provided that lets users build filters for virtually any file format or application.

The product takes advantage of the distributed database capabilities of Oracle's latest release of its relational DBMS, Version 7. In addition, the text retrieval software can utilize SQL*Connect, Oracle's gateway software, for access to third-party databases such as IBM's DB2 and outside data sources such as stock feeds or imaging applications.

Analysts believe V2.0 will give users new flexibility in document retrieval. "They've built a product that is a bridge between structured and unstructured information," said Ann Palermo, research director at International Data Corp. in Framingham, Mass.

SQL*TextRetrieval V2.0 is currently available. Support for DOS and other Unix platforms will be added shortly. ∎

Firms team to prep powerful NetWare DBMS

By Caryn Gillooly
Senior Editor

REDWOOD SHORES, Calif. — Oracle Corp. and NetFrame Systems, Inc. last week announced they are working together to provide Novell, Inc. NetWare users with multiprocessing database capabilities.

The two vendors revealed they are jointly developing a product that lets the NetWare Loadable Module (NLM) version of Oracle's database management system — Oracle Server for NetWare 386 — work across multiple processors within a single NetFrame server.

The new product will not only dramatically boost database performance, it will provide levels of fault tolerance and scalability not currently available to NetWare users, according to officials from both Net-

NTI offers potent new ACD call mgmt. platform

By Michael Cooney
Senior Editor

NASHVILLE — Northern Telecom, Inc. (NTI) last week rolled out a new management platform for its central office switches and automatic call distribution (ACD) systems that supports more users and a graphical user interface (GUI).

The new DMS Call Center MIS will help managers improve the performance of their call centers by enabling them to monitor multiple agents and ACD groups in real time from a customizable GUI-based monitor, a first for NTI.

Call Center MIS is designed for call centers using NTI's DMS-100 central office switch, Meridian 1 Option 111/211 private branch exchange (previously know as the SL-100) or a DMS Meridian ACD server.

It can monitor calls for between two and 2,000 agents and can handle as many as 35,000 calls per hour.

The new management platform replaces NTI's personal computer-based RT-100 management system. The RT-100 supported 11 supervisor terminals and could monitor 500 agents and fewer than 12,000 calls per hour, said Donna Justice, senior manager of product management for Call Center Solutions.

By contrast, the new platform is based on a Motorola, Inc. 88000-series Reduced Instruction Set Computing processor running Call Center MIS software. The software is modular, so users can upgrade quickly if they need more capacity, Justice said.

The unit is linked to the central office switch, PBX or ACD via a standard data or

Frame and Oracle.

"Yes, an Oracle NLM is available now and has been out for about a year, but it's uniprocessor-based," said Steve Seminario, manager of software marketing at NetFrame, based in Milpitas, Calif. "Our goal is to take the same NLM and add value to let it run in multiprocessor mode."

NetFrame sells a line of superservers that boast high speeds and fault tolerance through parallel multiprocessing, which entails multiple processors acting in a loosely coupled fashion or as a cluster.

For example, within a NetFrame super-server, a customer can load up to four individual processors, each on its own board and each basically acting as its own computer. These "computers" communicate via the system bus.

Like asymmetric multiprocessing, each processor handles its own jobs. In contrast, symmetric multiprocessing jobs are split up among processors.

However, unlike asymmetric multiprocessing, each processor in the parallel environment serves as its own computer because each has its own dedicated memory. This eliminates the possibility that the memory will become the system bottleneck, as is possible with both symmetric and asymmetric multiprocessing.

Since NetWare is a single-processing operating system, it does not easily support multiprocessing.

To get around that, NetFrame and Oracle intend to have each processor in the NetFrame server run its own copy of NetWare. Their jointly developed software will allow the Oracle database to work across the multiple processors.

"We would run multiple copies of Net-

Groups converge on imaging spec

Peter Bono, managing director of Peter Bono Associates, Inc., a computer graphics consulting firm in Gales Ferry, Conn., said, "The motivation is to come to a global consensus on a format for passing imaging [data] between systems." Bono is also chairman of Accredited Standards Committee X3 for Information Processing Systems.

IPI is being processed simultaneously by the International Standards Organization, ANSI and standards bodies in a dozen other countries.

Carrying the name ISO 12087, the IPI specification is expected to reach draft international standard status by October of next year, a stabilization point where products are often implemented.

The IPI specification consists of three parts. The first part describes a basic image handling system. The second, dubbed the Programmer's Imaging Kernel System (PIKS), is an application program interface (API) intended to be used as the building block for a broad range of imaging applications. The third part details image sharing over a network.

Bill Pratt, director of multimedia and imaging technology at Sun Microsystems, Inc. and the document editor for the PIKS technology, said the APIs would allow developers to build a variety of applications, such as for medical or geophysical imaging.

"It's rich in terms of capability," Pratt said.

But IPI's acceptance could be slowed by a de facto standard currently gaining ground, the Tagged Image File Format (TIFF), an open specification from Seattle-based Aldus Corp.

TIFF has some limitations. While both TIFF and IPI can handle monochrome and color images, IPI also supports floating point numbers that give images a three-dimensional texture.

But TIFF is available now. "TIFF is not bad, but it's basically just filling a void," Pratt said.

IPI has a ways to go and marketplace hurdles to overcome. Members of the ANSI X3H3 subcommittee for image processing and interchange as well as ISO SC 24 committees will meet in Munich, Germany, on Oct. 5 to consider input received by the Sept. 22 deadline for initial comments on the draft standard. A second committee draft is expected to be issued by early next year.

"We expect that in September or October 1993, a draft international standard version of the text will be approved," Bono said. "We've been working on the requirements leading up to this since June 1988. It's taken three years to build consensus."

However, while ANSI's X3 information processing systems committee and ISO are working in close coordination, a lack of harmony is apparent on U.S. turf. Members of another accredited ANSI group, the X9B9 image interchange standard subcommittee, appear to have little interest in X3H3 work and are considering a banking imaging standard.

"It looks like there's overlap," said Bono, who conceded the two groups have not agreed on a common approach. "Standards work is based on volunteerism. There's no system to force anyone to work together." **Z**

Firms team to prep offering

Ware — one per application processor — and the NLM would let them all act in concert," Seminario said.

The benefits for NetWare users are threefold. First, having a single database run across multiple processors will provide noticeable performance enhancements, although neither vendor would provide estimates on how much faster the Oracle NLM will run with the new capability.

In addition, the multiple processors will ensure that the system will not go down if one processor fails because the other processors will pick up the slack. Today, because NetWare is a uniprocessor environment, if one processor goes down, the server will generally go with it.

Finally, parallel multiprocessing is designed to be more scalable than other types of multiprocessing. Users can add as many processors as the system will hold, scaling the database to several times its original power but using the same hardware and applications, and not causing a bottleneck on the system's memory.

Analysts agreed this capability will be of great interest to high-end NetWare customers that want to dedicate a NetFrame machine as their database server.

"People are looking for platforms like this to write client/server applications on," said Todd Dagres, an analyst at The Yankee Group, a consulting house in Boston. He explained that this will provide users with a much more fault-tolerant environment in which to bring mainframe databases down to the local-area network.

Although neither company would further discuss the offering that is expected to come from their agreement, Seminario said a final product will be available in about a year. **Z**

Users troubled about increases

observation. "It would be OK for IBM to increase prices if they were making their SNA software easier to install and operate, but that's not happening," said Jim White, a network architect with E.I. du Pont de Nemours & Co. in Wilmington, Del. "In our case, every time IBM increases prices, we get nudged more toward the OSI and TCP/IP worlds, where more competition reigns."

IBM has acknowledged SNA configuration complexity in the past and has made strides to make SNA more user friendly with more dynamic VTAM features and increased SNA help desk services.

"We could absorb a 5% increase in software prices if IBM would make SNA 5% easier to work with," White said. "Our SNA network is already more expensive per packet and per user node than anything else we do."

One user who requested anonymity blasted what he called IBM's already unbelievably high Open Systems Interconnection products. "It really frosts me that they could raise those prices any higher than they already are," he said, adding that IBM OSI mainframe implementations can hit the $100,000 to $200,000 mark in software alone.

Other users took the price increases with a grain of salt.

"Anytime our bottom line goes up, we are concerned, but we feel we've gotten better price/performance out of our IBM network this year, so we're not unhappy," said Kazim Syne, manager of technology and operations for the Royal Bank of Trinidad and Tobago in Port-of-Spain, Trinidad.

The bank was a beta site for IBM's Networking Systems/2 Advanced Peer-to-Peer Networking software.

Analysts said these price increases, unlike last year's late summer price hikes, were not accompanied by price cuts elsewhere. In 1991, IBM upped some hardware prices an average of 5% but slashed others by more than 10%.

"The prevailing attitude about software is that because it was underpriced for so long, many companies believe they can continue to up the price and no one will

mind," Burris said.

Others said users have gotten so used to price increases from IBM that they budget for them ahead of time. That action may have helped some users this year since IBM did not increase prices as much as it has in the past. **Z**

Molson adds architecture

be more efficient in the area of sales or industry forecasting because in that fourth-generation language-type environment, it will be easier to develop new systems and make changes to existing ones."

Molson currently has a 900-plus user Systems Network Architecture net anchored by a mainframe at its Montreal data center that communicates with System/36 minicomputers and 5250 terminals at nine breweries across Canada. The company uses cluster controllers to tie the minicomputers to the mainframe in a star configuration based on leased lines or dial-up X.25 links.

The plan is to replace the terminals with personal computers attached to token-ring local-area networks and rewire all the facilities with a fiber backbone and unshielded twisted-pair links to the desktop.

The mainframe and System/36s will also be phased out, and the applications running on them will be migrated onto new platforms, according to Gates.

A maintenance application that runs on the System/36s, for example, will most likely be converted to an IBM Application System/400 minicomputer, and mainframe applications will move to either the AS/400s or a superserver. Additionally, the new network will support all of Molson's billing, order-entry, collection, manufacturing and distribution applications.

"We're still in the process of completing a requirement study, with a goal of not only replacing the functionality on the mainframe, but also building flexibility into the net that will address future plans and meet the needs of our internal information technology users," Gates said.

The new internet is key to that flexibility. "The new setup will be far more advanced in that we're going to have distributed AS/400s running as servers on the LANs, which will be connected together through routers from Cisco," he said. "The gains in flexibility and fault tolerance of the Bytex hubs, coupled with the centralized management, will benefit operations greatly."

All the LANs will run Novell, Inc.'s NetWare 3.11 and will talk to the SNA mainframe in Montreal via Novell's NetWare/SNA gateway.

The LANs will be connected in a mesh configuration, allowing devices at the Vancouver facility to speak directly to the Edmonton, Alberta, plant, for example, instead of going through the mainframe in Montreal, as is currently required.

Until the mainframe is phased out, the Cisco routers will encapsulate the SNA traffic to transport it across the internet.

This approach will significantly improve communications among the breweries and make the net more efficient, which will ultimately increase productivity, according to Gates, although he declined to detail cost savings associated with the project.

One of the major advantages the new net is expected to bring is greater network control.

"The Bytex hubs will allow us to control and monitor the net from a central location, enabling us to make changes as required without the necessity of sending technical people to each brewery to troubleshoot a problem," he said.

With the assistance of BGI Systems Integration of Markham, Ontario, Molson has begun the migration with the installation of the Bytex hubs, Cisco routers and AS/400s at corporate headquarters here and at breweries located in Barrie and Etobicoke, Ontario.

Over the next 12 months, Molson's seven other breweries will be added into the new network in Edmonton and Calgary, Alberta; Montreal; Regina, Saskatchewan; St. John's, Newfoundland; Vancouver; and Winnipeg, Manitoba. Future innovations are also planned, but Molson is focusing on the current migration.

"What we're really trying to do is move from a '70s to a '90s environment," Gates said. "We eventually want to integrate voice and data, but we can't even look at that until this migration is completed." **Z**

Insurer adds fraud protection

While not directly comparable, AT&T and Sprint Corp. have also launched toll fraud monitoring and liability protection services for their customers in recent months. MCI Communications Corp. is readying a package, but further details were not available.

"When you see an outside company getting into this business, that's a sign toll fraud is a significant issue," said Mike Kilbane, general manager of systems development at Diamond Shamrock Refining and Marketing Company, Inc. in San Antonio, Texas.

Robert Rosenberg, president of Insight Research Corp., a Livingston, N.J., market research firm, said The Travelers is hoping to tap into a ground swell of concern.

"The insurance industry will do nothing on a whim," he said. "[It] always requires hard numbers to quantify a problem before really addressing it. There's a market for this."

The Travelers' policy is designed to cover losses from remote access toll fraud — typically involving unauthorized individuals tapping into a company's private branch exchanges and stealing long-distance calls, said Frank Scheckton Jr., director of commercial crime insurance at the insurance firm. The policy will not cover internal phone fraud, but the company has other plans covering employee crime that can be packaged with the new toll fraud policy at a discounted rate.

Toll fraud policies can be purchased covering losses ranging between $50,000 and $1 million a year. The highest end policy will carry a $49,000 premium and a $100,000 deductible. A $50,000 policy has a $2,500 premium and a $5,000 deductible.

The Travelers has introduced its policy in response to customer and broker demand, Scheckton said. The toll fraud crisis is growing for a number of reasons, including the depressed economy, he explained.

"It's surprising how many companies don't realize that their PBXs have a remote access feature and that they are at risk," Scheckton said.

John Haugh, chairman of Telecommunications Advisors, Inc., a Portland, Ore., consulting firm, said the good news about The Travelers' new policy is that it gives users more options for protection.

But he pointed out that the policy is more expensive than the carriers' liability protection plans and does not include any network monitoring, as do AT&T and Sprint.

Scheckton acknowledged that The Travelers may need to adjust pricing after evaluating customer claims. Another challenge will be evaluating claims for toll fraud losses since pinpointing illegal calls is not always easy, he said.

Paul Evenson, a vice-president in the telecommunications group at Montgomery Securities in San Francisco, said there will be a market for toll fraud protection packages from insurance companies and carriers. But an internal battle could ensue within companies between net managers and chief financial officers (CFO) over whether to buy such policies from carriers or insurance companies, he added.

"Network managers are probably going to want to go with their personal carrier, as that should help to make the carrier work harder to prevent toll fraud," he said. "On the other hand, the CFO might want to go with the company's established insurer." ◪

NTI offers new ACD platform

X.25 link at speeds up to 64K bit/sec. A redundant link option lets managers keep a "warm" link ready in case the primary link fails.

The system supports as many as 32 supervisor terminals or PCs running as either standard character-based devices or with an optional Microsoft Corp. Windows interface.

When the platform becomes available, supervisory terminals and PCs will be linked to the Call Center MIS via a serial port, but Justice said NTI was working on adding an Ethernet local-area net link.

The platform monitors calls to the central office or on-site switch and reports to the supervisory terminals status and statistics, such as the length of the calls or the number of calls in the queue. Call statistics can be monitored in real time or stored in Call Center MIS's database for historical reports.

Call Center MIS provides 13 standard historical reports and can generate more than 250 user-defined reports.

"The new platform gives users a stronger processor and more configuration flexibility than the RT-100," said Allan Sulkin, president of the TEQConsult Group consultancy in Hackensack, N.J.

According to Sulkin, the RT-100 could not handle the large volumes of traffic many larger ACD shops were producing. The new platform will remedy that, he said, while its scalability should make it useful for small ACD users, as well.

Gwen Daniels, area manager of product management for Southwestern Bell Telephone Co. in St. Louis, Mo., agreed with Sulkin's assessment and said it will enable her company to offer new services to some users. "The scalability of the Northern platform will let us offer ACD management to smaller users who never would've used it in the past."

Southwestern Bell Telephone and 17 other phone companies have evaluated the new platform and are considering implementing it when it becomes available.

Justice said the new systems will enter beta tests in the first quarter of 1993 and be available by the second quarter. Only entry-level pricing, about $20,000, has been set for the Call Center MIS platform on the DMS Meridian ACD. ◪

AT 1:00 THE BOSS SAID, "WE NEED A VIDEOCONFERENCE...NOW."

1:00

With AT&T Global Business Video Services, you don't have to call us to place a reservation for a point-to-point videoconference. Because with our Switched Digital Services network, we're ready whenever you are.

The Light At The End Of The Network.

AT&T has the largest fiber-optic digital network with connections, in a variety of speeds, to more domestic and international locations than any other carrier.* Dialing your videoconference is as easy as dialing a telephone call. And the price is almost as affordable.

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AT&T's Global Business Video Services also offers you a wide variety of additional capabilities. We can link network sites that use other AT&T Switched and Reserved digital services. And we also offer multipoint bridging, speed and codec conversion.

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1:01

A Video Center That's All Yours.

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Whether it's network design, equipment solutions or developing the right video applications for your business, AT&T will be there to help you.

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If AT&T Global Business Video Services looks good to you, call us at 1 800 VIDEO GO.

AT&T
The right choice.

Data Packets

Harris Adacom Corp. of Dallas this week will roll out a suite of IBM 3270/5250 emulation products that will link TCP/IP net users to IBM mainframe and mid-range computers.

The new Harris Adacom 9700 Presentation Services products feature a common user interface and color graphics support.

The offerings run as client software and require no changes on the Transmission Control Protocol/Internet Protocol or IBM host.

The emulators include tn3270/3179G TCP/IP support for DOS, Unix, X Window System and Windows clients. Mid-range tn5250 TCP/IP support is now available for Unix, VMS and Windows clients.

The DOS products support single sessions to one host at a time, while the Windows emulators support four sessions with as many as four different hosts. Unix, X Window and VMS clients can have as many sessions as their machine memory will allow. Users can hot-key between host sessions and applications running under their native operating system.

DEC sets sail for its Ultrix system management voyage

FullSail lets managers automate Ultrix performance.

By Jim Duffy
Senior Editor

MAYNARD, MASS. — Digital Equipment Corp. has unveiled software that allows users to monitor file and system usage on Ultrix workstations distributed throughout a TCP/IP network.

DEC's new FullSail is software that runs on DEC's Ultrix workstations. It includes client software that serves as a management agent and carries out management commands, such as updating configuration tables and adding a password.

The software also includes an Ultrix/SQL database and three management applications.

FullSail allows systems administrators to automate Ultrix performance and capacity management routines, as well as systems administration, according to DEC.

"It provides a high-level view," said Roy Shiderly, DEC marketing manager for Unix systems management. "If you want to raise the temperature, you don't have to get the coal and stoke the fire."

FullSail allows administrators to group Ultrix systems together into managed domains using a front-end application called Navigator. The systems can then be managed either collectively or individually by launching applications from the Navigator front end.

Navigator also allows systems administrators to control the level of access other users have to the managed groups.

Management applications

The three management applications Navigator can launch are Account Manager, Filesystem Manager and Performance Manager.

Account Manager allows systems managers to add, modify, delete and review individual user accounts and groups of accounts, such as disk quotas, login shells, directories and group memberships.

Using Account Manager, net managers can execute custom routines when adding a single user or use batch processing capabilities for adding large numbers of users to a network.

FullSail allows administrators

Package lets 3270s access wireless nets

By Jim Duffy
Senior Editor

FARMINGTON, Conn. — Telepartner International last week brought out hardware and software that allows users of notebook and laptop computers to log into IBM mainframes over wireless networks.

The products, called Mobi/3270 and Mobi/74, enable traveling employees, such as field sales representatives, to access transaction processing applications and electronic mail messages on an IBM mainframe through 3270 terminal emulation.

Mobi/3270 is 3270-emulation software for notebooks and laptops, while Mobi/74 is a 3174-like controller for attaching mobile personal computers to the IBM mainframe.

The products work with RAM Mobile Data's Mobitex packet network, which is accessed through a wireless modem made by Ericsson GE Mobile Data, Inc.
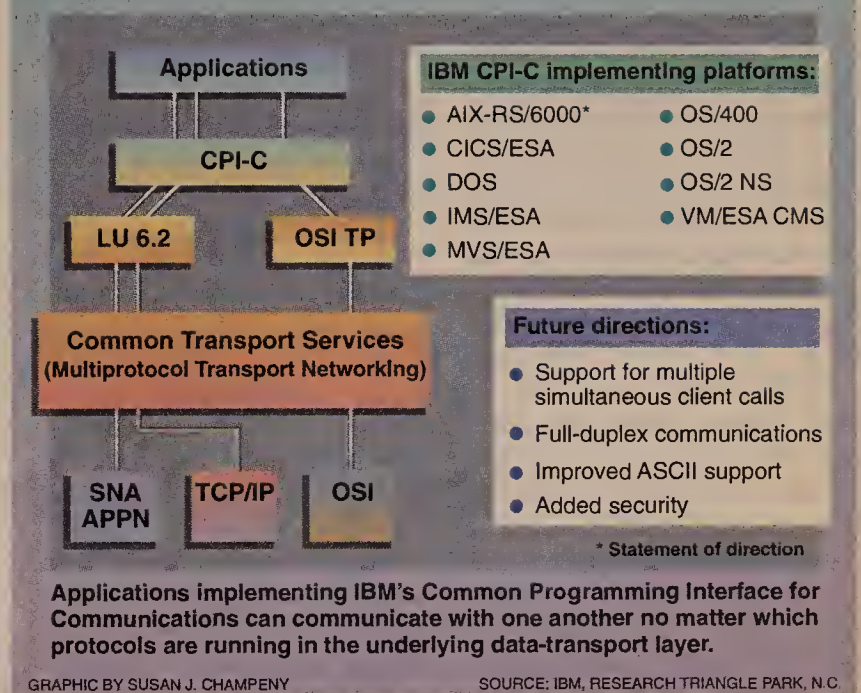
The DOS connection

Mobi/3270 works under DOS. When a user establishes an 8K bit/sec link to Mobitex, radio packets are sent over the wireless net and are mapped into X.25 packets by a gateway at a RAM Mobile Data point of presence.

The X.25 packets are then sent to the Mobi/74 controller over a 9.6K bit/sec-to-56K bit/sec link. Mobi/74 forwards data to an IBM front-end processor (FEP) over a Synchronous Data Link Control line running at up to 56K bit/sec or a 4M or 16M bit/sec Token-Ring connection.

Mobi/74 is based on an Intel Corp. i386 PC. It houses two communications cards — one for X.25 and another for SDLC — both manufactured by Eicon

CPI-C: IBM's multivendor API

IBM CPI-C implementing platforms:
- AIX-RS/6000*
- CICS/ESA
- DOS
- IMS/ESA
- MVS/ESA
- OS/400
- OS/2
- OS/2 NS
- VM/ESA CMS

Future directions:
- Support for multiple simultaneous client calls
- Full-duplex communications
- Improved ASCII support
- Added security

* Statement of direction

Applications implementing IBM's Common Programming Interface for Communications can communicate with one another no matter which protocols are running in the underlying data-transport layer.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: IBM, RESEARCH TRIANGLE PARK, N.C.

IBM takes aim at multivendor apps

Preps CPI-C enhancements that promise to bolster its popularity as an application development tool.

By Michael Cooney
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — IBM is once again loading its CPI-C shotgun for a blast at the multivendor network application industry.

Big Blue's Common Programming Interface for Communications, its strategic communications programming interface, had been left for dead by many developers as little as a year and a half year ago. But developer interest is resurfacing, fueled by IBM promises that CPI-C will go beyond its Systems Application Architecture (SAA) role and provide services to users running applications over Transmission Control Protocol/Internet Protocol and Open Systems Interconnection nets.

CPI-C is part of IBM's SAA, which spells out how the company will port applications across its own OS/2, OS/400, VM and MVS system platforms. CPI-C provides the interface to IBM's LU 6.2, and together, the two support peer-to-peer application services and synchronize program processing between distributed platforms.

IBM is also fueling the CPI-C fire with promises of an improved interface for client/server applications and improved security features. In addition, the company has opened its arms to devel-

opers through its Advanced Program-to-Program Communications market-enablement program and promises of open APPC/Advanced Peer-to-Peer Networking developers conferences like the one held here three weeks ago ("Developers: Steep license fees will slow APPN rollout," *NW*, Aug. 17).

IBM is fueling the CPI-C fire with promises of an improved interface.

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"The real idea of CPI-C is to let users or software developers write applications on top of one platform, take that application, move it to another platform, recompile it and be off to work again — without having to worry about the underlying transport protocols," said John Walker, director of IBM's APPC market-enablement group.

Walker said IBM does not count the number of CPI-C licensees, but industry experts estimate there to be between 15 and 25

IBM aiming at multivendor apps

companies, and growing. They include Apple Computer, Inc., Data General Corp., Network Software Associates, Inc. and Systems Strategies, Inc. For comparison, more than 40 firms have developed LU 6.2 applications.

While CPI-C's features have been available to users and developers for a while, it is CPI-C Level 1.2, scheduled to be available this fall, that has developers excited. That is because it eliminates many of the interface's past problems.

IBM started numbering its CPI-C releases about two weeks ago. CPI-C 1.0 and 1.1 are supported in various IBM operating systems today, and CPI-C Level 2 is expected late next year.

The biggest obstacle to widespread CPI-C implementations has been the interface's inability to support multiple incoming calls to one application from another. Today, CPI-C applications can handle only one session at a time.

Features that will eliminate that problem include "Nonblocking" and "Accept multiple." These features will let a central database application simultaneously update other databases on a net, according to analysts.

"CPI-C applications with these features will make servers much more powerful," Walker said.

Support for multiple incoming conversations will be further enhanced in the future with the addition of full-duplex LU 6.2, which will let multiple programs send and receive data simultaneously. Full-duplex support will be added in CPI-C Level 2, he said.

> I BM wants users to move toward APPN and use CPI-C applications across it.
>
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Another major feature being added to CPI-C is the ability to automatically convert its EBCDIC character sets into ASCII data.

"Support for this automatic conversion is basic, but it's also necessary if CPI-C is to become a multivendor standard because most other vendors standardized on ASCII," said Thomas Routt, president of Vedacom Corp., a Seattle consultancy.

Also being added to CPI-C Level 1.2 will be security features such as user identifications and passwords. These basic security features, which were left out of CPI-C's initial releases, obviates the need for programmers to include them in each application.

Many of these new CPI-C features are a direct result of the X/Open Company, Ltd. consortium incorporating CPI-C into its Common Applications Environment in 1990.

When X/Open licensed CPI-C, it added features such as ASCII communications and the ability to handle multiple client calls from one application, creating a new, more functional CPI-C version. IBM is adding X/Open's extensions to its own version so the two will be compatible.

"Once IBM extends CPI-C to include the X/Open specifications, that will open the way for the CPI-C market in general," said Routt. "IBM wants CPI-C to become an industry standard, but it's going to have to create serious market momentum first."

IBM hopes to create that momentum by pumping up CPI-C and showing that CPI-C applications can work in non-SNA environments, particularly TCP/IP. CPI-C can already map to OSI's Transaction Processing standard.

Strategically, IBM wants users to move toward APPN and use CPI-C applications across it, said Russ Hertzberg, product marketing manager for Network Software Associates, an SNA software developer in Laguna Hills, Calif. "Tactically, IBM will offer TCP/IP CPI-C support for users who need it now." ⊡

Data Packets

All 9700 products are available now, except tn3179G for Windows, which is expected to ship in the fall. Prices for the new software are as follows: tn3270 for DOS, $295; tn3270 for Unix and X Window, $595; tn3270 for Windows, $495; tn5250 for Unix and VMS, $595; tn5250 for Windows, $495; tn3179G for DOS, $495; tn3179G for Unix and X Window, $795; and tn3179G for Windows, $645.

RAM Mobile Data in New York is now supporting the Transmission Control Protocol/Internet Protocol over its Mobitex wireless data network, enabling mobile computer users to share files and electronic mail messages with other TCP/IP users.

RAM worked with communications software developer TEKnique, Inc. to develop a TCP/IP packet driver for the wireless network. In addition to TCP/IP, RAM also supports X.25 in its Mobitex packet network.

TEKnique will supply the packet driver, E-mail and file transfer software as well as a customer premises gateway/router, which links the RAM net to a corporate TCP/IP network.

The TCP/IP protocol stack, including E-mail and file transfer applications, is priced from $200 to $400 per user, depending on quantity. The packet driver is priced from $10 to $50 per user, depending on quantity. The products are available now. ⊡

Fla. at work on custom system

ported by SUNCOM users. The engineers perform network diagnostics and access alarms from the SNA network through IBM's NetView and via connections into Northern Telecom, Inc.'s DNC-500 computers in carrier networks for voice facilities. Voice net problems are resolved hand-in-hand by Network Control Center staff and SUNCOM carriers.

The new net management system will be anchored by two dual-processor Motorola, Inc. 8840 minicomputers running Unix that will be linked by an Ethernet LAN, said Gene Monacelli, director of commercial systems integration at CBIS. The computers will run a host of net management applications designed by CBIS that will sit on an Oracle Corp. database management system.

These applications will include data collection, switch access, network configuration, trouble tickets, system administration, traffic reporting, network monitoring, simulation, call accounting and service administration.

One computer will be dedicated to culling call detail information from the data collection devices provided by carriers at 15-minute intervals — twice as often as the existing system provided to Florida by GTE Corp. It will feed that data to the second computer, which will handle a variety of administrative functions, including billing record preparation.

This computer will also be the entry point for network alarms. It will drive a 67-in. monitor that will give a graphic representation of SUNCOM to a roomful of network engineers. It will also forward data to engineers' workstations and personal computers linked via an IBM Token-Ring Network.

Because the management system is oriented toward managing transport facilities rather than actual devices on the net — most of which are owned by telephone companies — it is not designed to use popular net management protocols, such as the Simple Network Management Protocol.

According to Royice Robbins, a consultant at CBIS, Florida's new net system will outperform the state's existing net manage-

> T he management system is oriented toward managing transport facilities.
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ment system largely because of its two-computer architecture.

"Today, most of the products on the market are one-box solutions," Robbins said. "By having a machine dedicated to the high-volume, constant collection process, we ensure that collection will not be interrupted by anything that could happen on a day-to-day basis, such as end-of-the-month billing runs."

Mayne added, "A common problem for anybody who runs a large network is that you can't get a handle on all of the components of that net in one network management system. You can put together several different pieces and you can come up with a solution that will enable you to get by, but it's not an optimum solution."

Under the CBIS contract, the systems integrator will provide on-site support for a minimum of four years. CBIS will also be able to monitor the SUNCOM net remotely if necessary. ⊡

Pack lets 3270s access wireless

Technology Corp. of Montreal.

Some observers regard E-mail as the "killer" application that will broaden the appeal of wireless networks. Mark Orenstein, chairman of Telepartner, disagrees.

"The killer part will be [access] to transaction-based applications in radio dispatching and sales industries," Orenstein explained.

Another company engaged in 3270 emulation over wireless networks is Simware, Inc. of Ottawa. Simware's SplitSecond RF software can be used with Mobitex or ARDIS Co.'s wireless network.

SplitSecond RF, however, requires IBM's Network Control Program Packet Switching Interface software on the IBM FEP and a terminal-emulation application running under Virtual Telecommunications Access Method software on the host. Mobi/3270, Orenstein said, does not.

Mobi/3270 is priced at $380 per user, while Mobi/74 is priced between $20,000 and $25,000 per 20 users. The products are shipping now. ⊡

DEC sets sail for Ultrix voyage

Filesystem Manager lets Ultrix workstations know about new file systems, such as disk drives, added to the network. Also, it allows administrators to manage those file systems to determine availability and capacity.

Performance Manager displays data about system capacity and activity, such as free memory, memory usage and disk throughput. Data may be monitored graphically in real time or it can be archived for export to spreadsheets and other applications.

Administrators can set alarms on Filesystem Manager and Performance Manager to be triggered when specific events or conditions occur, or to kick off a script to automatically invoke remedial action.

Information collection

The FullSail database, meanwhile, contains management and configuration information for every Ultrix workstation in the network. The database can collect changes to the configuration of individual Ultrix systems or managed groups and can mirror existing configuration and file tables

to automatically update new systems.

FullSail applications utilize the database information to batch-process management functions and simplify the tasks involved in adding a system to the network.

For example, Account Manager can update the database about a configuration change to a managed group. If one or more systems in the group were down while that change took place, Account Manager could automatically update those systems when they were back on-line.

Also, when new systems are added to a managed group, Full-Sail, using remote procedure calls (RPC), automatically updates the configuration files for those systems from the information stored in the database. RPCs eliminate the need to log on to each system and manually edit configuration information, according to DEC.

FullSail is priced at $300 per client license, $6,000 per server for the database license and $2,000 per server for the application license. It will ship in September. ⊡

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And at 20 PPM, that's an average of 100% faster than HP IIIsi in PostScript applications. Which helps keep your network's output more than up to speed.

Then there's the ability to print in sizes up to 11" by 17". Which can really make your day if it's filled with everything ranging from envelopes to double-page layouts to CAD plots to spreadsheets.

The built-in motorized paper trays can hold up to 1,500 sheets, more than any other desktop printers. Allowing you to put your time to far better uses than loading paper.

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Completing the picture is the 800 x 400 COMPAQ High-Resolution Print Mode, created to give you exceptionally crisp text and graphics.

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You have the brainchild of a company which holds the belief that utter chaos does not have to be standard operating procedure in your network.

For more on COMPAQ PAGEMARQ printers, just turn to the next page.

They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple Twin-Trays hold up to 1,500 sheets. Impressed?

Our Intelligent Emulation Sensing feature continually monitors, then automatically adjusts to either PostScript Level 2 or PCL 5 depending upon which language you're using. You needn't lift a finger.

Sensing feature that continually monitors, with radar-like precision, the language which anyone is using at any moment. It will then automatically adjust to that emulation, without your lifting a finger.

A truly network-ready printer should meet all of your network needs. This is why our new COMPAQ PAGEMARQ Laser Printers provide a direct connect to both Novell and AppleTalk environments, without the need for a print server.

The printers also offer you five interfaces, so that you can simultaneously run Ethernet or Token Ring, AppleTalk, both a serial and a parallel port, and even an Internal FAX Modem. Which will lead to better communication across the entire network. Rather than the kind of language that

COMPAQ

THOSE WERE THE BROADSTROKES. NOW HERE'S THE FINE PRINT.

COMPAQ PAGEMARQ 20: *20 PPM ≪ 20-MHz AMD 29000 RISC w/128-K cache ≪ 4MB RAM standard, expandable to 20MB ≪ 1,500-sheet (standard)*

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BOTH MODELS: *Up to 800 x 400dpi (COMPAQ High-Resolution Mode) ≪ PostScript Level 2 and PCL 5 w/Intelligent Emulation Sensing ≪ One slot/port each for AppleTalk, Network Interface Cards, Internal FAX Modem, Serial and Parallel Port ≪ Available Options: Internal 60-MB Hard Drive, 1- and 2-MB Programmable Font Modules ≪ Consumables: One-piece cartridge w/12,000-page yield*

At Compaq, we realize even the most advanced network printers in the world aren't worth the toner in their cartridge kits if you can't get the service or the parts that you need whenever you need them.

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You'll find dedicated printer specialists eager to convince you that the path to greater network productivity begins not only within yourself, but along the paper path that is inside your COMPAQ PAGEMARQ Laser Printer.

Five interfaces, with a direct connect to Novell and AppleTalk, lets you simultaneously run Token Ring or Ethernet, AppleTalk, a serial and parallel port, plus an Internal FAX Modem.

Store PostScript fonts forever. Expand your font library. And eliminate constant downloading with Programmable Font Modules or the internal 60-MB Hard Drive.

With our printers' optional Internal FAX Modem, you can send and receive presentation-quality documents, in sizes up to 11" by 17". Right from your desktop.

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Memorial Press Group is a very busy publishing company. They own ten award-winning community newspapers, operate a successful commercial printing company, and publish popular vacation guides for Plymouth and Cape Cod.

As diverse as MPG's divisions are, they have one thing in common: a commitment to excellence – whether they're covering local news, printing college course selection booklets, or telling tourists where to find the best fried clams.

MPG knew the phone was critical to their success – they used it to sell ads, gather news, even transmit and print papers. So when they wanted to use the phone to improve customer service and lower costs, they looked

to New England Telephone.

MPG has a long-standing relationship with their New England Telephone account executive, Julie Mountain; they know Julie's looking out

Read All About It.

for their best interests. "It was hard at first getting used to the fact that she was trying to save us money, not just sell us something," says MPG Purchasing Manager Bruno Andracchio. And

Business Planning Analyst Claudia Beaulieu adds, "Now she's part of our team."

As MPG's business grew, their network couldn't keep up with the demands on it.

They knew they could rely on Julie for a solution.

Each MPG newspaper had a local exchange number that carried local calls over a dedicated line to their headquarters in Plymouth. With circulation increasing and more calls coming in, the numbers often became blocked.

MPG knew every busy signal could mean a lost customer. And lost business. So Julie met with a team of analysts from New England Telephone to review MPG's extensive dedicated line network, and their toll usage.

Since open lines are critical for MPG's growth, Julie

Worth Noting

Because LANs come from the PC world, customers expect LAN service and support to be free, according to Richard King, vice-president of services and support at Novell, Inc. But many networks are very large and deal with highly complex issues, he says, so users should budget in service and support just like they do in mainframe environments.

Netnotes

Blue Lance, Inc. last week introduced DatArray, a product the company says will make Redundant Array of Inexpensive Disks (RAID) technology affordable to the lower end networking user.

DatArray is a combination of hardware and software that provides customers with RAID Level 5 capabilities.

However, DatArray is different from other RAID offerings in that it is modular, meaning customers have the option of buying the hard drives and controller boards from Blue Lance or they can use what is already installed in their systems.

Many other RAID products are hardware-dependent and require the customer to use the same vendor's hardware and software. Others are firmware-based, wherein the RAID capabilities are actually embedded on the disk controller board.

DatArray will be available next month from Houston-based Blue Lance. The soft-

Racing past the competition

In independent testing conducted by LANQuest Labs, 3Com's new 16-bit Industry Standard Architecture EtherLink III 3C509 adapter card outperformed its competition in both LAN Manager and NetWare environments.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: 3COM, SANTA CLARA, CALIF.

3Com puts oomph in new EtherLink III adapter line

Cards beat out competition in independent testing.

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — 3Com Corp. last week rolled out a series of Ethernet adapter cards based on a new architecture designed to significantly improve performance.

The EtherLink III family comprises coaxial cable and 10Base-T versions of 16-bit Industry Standard Architecture (ISA), 32-bit Extended ISA (EISA) and 32-bit Micro Channel Architecture (MCA) adapters.

The cards are based on 3Com's Parallel Tasking Architecture, which speeds data transfers by allowing separate tasks to be performed simultaneously. An EtherLink III adapter, for example, can begin processing a packet as it is coming off the wire, unlike typical adapters that must receive the complete packet before processing it.

In addition, the cards support features that make it simpler for users to install them.

"3Com has really raised the bar in the adapter market in terms of price/performance," said Todd Dagres, director of data communications research and consulting at The Yankee Group, a Boston consultancy. "The 16-bit cards are faster than most 32-bit cards on the market. They're probably offering 60% better performance for about 10% less money."

In benchmark tests conducted by LANQuest Labs, the EtherLink III 16-bit twisted-pair ISA adapter outperformed similar products from Eagle Technology, Intel Corp. and SMC Corp. by as much

> **"3**Com has really raised the bar in the adapter market in terms of price/performance."
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as 55% (see graphic, this page). Test results were provided by 3Com.

The same card also outperformed 32-bit EISA adapters from companies such as Eagle and Mylex Corp. by as much as 20%.

According to 3Com, the key to these performance results is a special application-specific integrated circuit (ASIC) chip developed by 3Com that supports all the functionality of the EtherLink III line, including the Ethernet controller, coder/decoder, twisted-pair transceiver, packet buffer and bus interface.

The ASIC chip supports an autodiscovery feature that allows

Virus detection pack spans Mac networks

Microcom intros software that provides centralized control to combat viruses infecting AppleTalk nets.

By Margie Wylie
Senior Editor

NORWOOD, Mass. — In an attempt to halt the march of increasingly pernicious Macintosh viruses over the network, Microcom, Inc. will ship in October a new version of its virus detection and repair software.

Networked-enabled personal computer virus detection programs are fairly common, but Virex 4.0 will be the first Apple Computer, Inc. Macintosh virus detection software to work over a network, according to Microcom.

The changing role of the Macintosh and the changing nature of its viruses prompted the company to offer software under the central control of an administrator.

"Viruses on the Macintosh started out being fairly benign," said a Microcom spokeswoman.

"At the worst, they might bomb your system." Because Macintoshes have become more a part of the business network, however, the nature of viruses has changed.

"We are finding viruses and Trojan horses that are more dangerous [and] do real harm to your system or your data," the spokeswoman said.

For example, the company recently warned of a Macintosh Trojan horse, called ChinaTalk, that appears as a sound driver but erases the disks on which it is installed. Two more recently uncovered strains, T-4A and T-4B, which were transmitted over the Internet, can damage Macintosh operating system files and applications so that users cannot boot their Macintoshes or run applications.

Firm rolls out token-ring tool with RMON support

By Caryn Gillooly
Senior Editor

TEWKSBURY, Mass. — Frontier Software Development, Inc. has brought out a token-ring version if its RMON-compliant NETscout LAN analysis and diagnostic software.

According to Frontier, based here, the new version is the first token-ring product to support the Simple Network Management Protocol Remote Monitoring (RMON) Management Information Base (MIB). With the Ethernet version Frontier brought out about a month ago, the NETscout line now provides distributed, standards-based network monitoring for almost any local-area network segment within the enterprise.

RMON is a recently developed SNMP MIB, introduced by the Internet Engineering Task Force. It defines a standard way to collect monitoring statistics from individual LAN segments and a way to then send that information to a centralized network manage-

ment console.

The new product consists of both agent and client software.

The agent software, called NETscout Model 9520, resides on a nondedicated Sun Microsystems, Inc. SPARCstation or a Syn-

> **A**ccording to Frontier, NETscout is the first token-ring product to support the RMON MIB.
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Optics Communications, Inc. LattisNet hub attached to a token-ring LAN. The agent performs such tasks as gathering traffic statistics, capturing packets and keeping an event log for user-specified items.

This information is then sent

Virus detection pack spans Mac networks

Macintosh networks, which tend be mostly ad hoc, have relied more on individual users to run their own copies of virus detection and repair software, leaving the matter of network security in the hands of users, said Pieter Hartsook, principal for "The Hartsook Letter" in Alameda, Calif.

However, as Macintoshes move more into business environments, that situation is changing.

Virex 4.0 is designed to centralize those critical functions under the control of an administrator. The package, which has a starting price of $599 for 10 users, requires that agent software be loaded in the background of Macintoshes before they can communicate with Virex administration software.

The administration software lets a manager trigger the same Virex functions that a user can perform locally. Managers can scan a station for infections and repair damage.

"We're acting in response to managers' pleas," said the Microcom spokeswoman. "When you have thousands of Macintoshes on a network, it is a real pain to have to go to each Mac and update it every time [a new virus is discovered]."

With about 32 strains and 400 different viruses, according to Microcom, the Macintosh suffers from far fewer ailments than its PC brethren, for which there are thousands. However, Macintosh viruses can spread faster because Macintosh networks, which tend to have a lower average number of nodes than PC nets, often rely on peer-to-peer file services, Hartsook said.

The flow of information is less controlled in networks that do not have a central file server, making it more likely that infected files will be passed from one user to another.

Like previous versions of Virex, the new program can detect all known strains of Macintosh viruses or Trojan horses, according to Microcom. The company also offers a $75 annual subscription service through which managers receive updates that detect new viruses as they appear. ⊒

3Com puts oomph in EtherLink III line

the adapter card to automatically "learn" what type of personal computer it is loaded into and adjust to the corresponding drivers and parameters, such as I/O address, interrupt level and transceiver type.

The card will automatically adjust itself to perform faster in a 486 PC, for example, than a 386 or 286 PC. Other adapters typically require manual setting.

For users that do not require the full power of a 32-bit card in their EISA PC, 3Com has included EISA configuration files with the 16-bit ISA adapter cards.

Scionix, a high-technology consulting firm in Sunnyvale, Calif., was a beta-test site for the 16-bit ISA card.

"The card performed very well in our OS/2 environment," said Chacko Neroth, a principal at the firm. "There are no switches on the card, so installation was practically automatic. It was faster than any other card we tested."

The 16-bit ISA cards, which can be managed by any Simple Network Management Protocol-based net management system, are available now in both 10Base-T and coaxial cable versions and are priced at $199 each.

The price per card drops to $182 when purchased in packages of five.

The 32-bit EISA cards will be available by year end, and the 32-bit MCA cards are expected to ship in the first half of 1993. Pricing on both products has yet to be determined. ⊒

Firm rolls out RMON token-ring tool

via a local- or wide-area link to the client software, called NETscout Model 9250.

"Today's network management systems can do configuration management, performance management, etc., but they have no built-in LAN analysis," said Narendra Popat, president of Frontier, based here. The alternative, he said, is to use a protocol analyzer, which often must be physically brought from site to site.

"But an RMON MIB-based LAN analysis [tool] can talk to any network management system," he said. "It lets the administrator send a diagnose request to an agent sitting on the segment to see, for example, why performance is poor."

The NETscout token-ring product is available now for the same price as the Ethernet product: $1,495 for the agent software and $2,995 for the client software. ⊒

INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

10Base-T Ethernet reaches for the stars

1990 total installed ports: 1.6 million

- Hewlett-Packard Co.
- Ungermann-Bass, Inc.
- Cabletron Systems, Inc. 16%
- 8%
- 6%
- SynOptics Communications, Inc. 32%
- Other 38%

1991 total installed ports: 4.1 million

- HP
- UB
- SynOptics 20%
- 10%
- 7%
- Cabletron 25%
- Other 38%

The worldwide 10Base-T market in terms of installed ports grew by 156% from 1990 to 1991. Figures for 1992 are not available yet.

GRAPHIC BY SUSAN J. CHAMPENY
GARTNER GROUP, INC., STAMFORD, CONN.

Sync Research upgrades its SNA net access products

SNAC offerings can now support more devices.

By Maureen Molloy
Senior Writer

IRVINE, Calif. — Sync Research last week announced enhancements that enable its two SNA network access products to support a greater number of devices.

Sync Research also announced that both SNA Network Access Controller (SNAC) devices will now be powered by Intel Corp. 80486 chips to provide increased processing power for high data load configurations.

Sync Research's devices use Synchronous Data Link Control conversion to make it easier for users to merge Systems Network Architecture traffic onto token-ring, X.25 and frame relay networks.

The company's SNAC for Token Ring Concentrator (TRC) is a multiport, AT-bus-based communications processor that provides token-ring local-area network connections for IBM terminals, cluster controllers and other devices supporting traditional SDLC and asynchronous protocols.

Sync Research also offers the SNAC/Group Poll Concentrator (GPC), which concentrates traffic from multiple cluster controllers onto a single SDLC point-to-point or multipoint trunk. It reduces the amount of SDLC and polling traffic to remote controllers and improves overall performance.

The SNAC/GPC mimics the function of IBM's Group Poll Gateway, a feature that enables a Personal System/2 token-ring gateway to respond to host polls on behalf of all devices on the net.

The enhanced SNAC/TRC and SNAC/GPC will now support as many as 60 IBM downstream physical units each.

Previously, the SNAC/TRC connected as many as 32 cluster controllers and other SDLC devices. The SNAC/GPC previously was capable of responding to a single broadcast poll from a front-end processor on behalf of as many as 32 attached controllers.

Increased support

Both devices now support NetView RUN COMMAND support for Sync Research's Network Management System (NMS) as well as an integral help system in NMS. This allows an operator at a NetView console to cull more detailed management information from the SNAC device.

The devices now also provide increased performance and reduced transport time through an enhanced SDLC polling algorithm that allows the devices to poll 50 times per second. Earlier software was limited to 20 times per second.

The new software enhancements are available now as a free software upgrade. For more information, contact Sync Research at (800) 275-7962. ⓩ

Netronix to make its mark on router mart

Vendor introduces series of low-end, mid-range devices that support TCP/IP and Novell's IPX.

By Maureen Molloy
Senior Writer

PETALUMA, Calif. — Netronix, Inc. this week will move into the router market with the introduction of a series of low-end and mid-range token-ring bridge/routers.

The TokenMaster Series multiprotocol bridge/routers include a five-port and a two-port device that support the Transmission Control Protocol/Internet Protocol and Novell, Inc.'s Internetwork Packet Exchange (IPX).

The TokenMaster 5000 is equipped with one local and four wide-area network ports that support speeds up to T-1.

The TokenMaster 1000 is equipped with one local- and one wide-area network port that supports speeds up to 56K bit/sec. It is aimed at users who need to connect LANs at small remote sites to a corporate backbone.

Designed for 4M and 16M bit/sec token-ring LANs, both models support the source routing protocol, the Routing Information Protocol and the Open Shortest Path First protocol.

The bridge/routers have a packet forwarding rate of 3,000 packet/sec for TCP/IP and IPX routing and 4,000 packet/sec for source route bridging. They have an aggregate throughput of 15.4M bit/sec or nearly token ring's wire speed. They also support 4-to-1 data compression on all wide-area network links and redundant power supplies for fault tolerance.

The devices use IBM's Mini-Module Token Ring Chipset, enabling them to achieve a 4,000 packet/sec forwarding rate, almost twice that of competing de- *(continued on page 21)*

New Andrew Corp. bridge to support frame relay

TORRANCE, Calif. — Andrew Corp. will announce at NetWorld 92 Dallas in October a token-ring bridge that supports frame relay.

The PathWise/7622 is a dual-port token-ring bridge that supports point-to-point or frame relay connections through a primary wide-area network port. On the local side, it supports a 4M or 16M bit/sec token-ring local-area network.

The device's frame relay interface supports virtual ring representation, which supports end-to-end management of interconnected token rings via IBM's LAN Network Manager.

The bridge supports expanded memory, dual-flash memory and associated configuration information that supports simplified code updates.

The PathWise/7622 is equipped with a Reduced Instruction Set Computing processor for wide-area network functions. In a future release, the bridge's secondary port will support multiplexing of Systems Network Ar- chitecture data, load sharing over redundant links, bandwidth-on-demand capabilities, as well as automatic recovery of failed links and dual-port packet switching.

The bridge is equipped with a Simple Network Management Protocol agent to provide monitoring and control capabilities from any SNMP-based network management platform. Its SNMP agent supports the Management Information Base (MIB) II specifications as well as Andrew Corp.'s private MIB extensions.

Future releases

The company said future releases of the PathWise/7622 will include support for data compression, the source routing transparent bridging algorithm and enhanced memory.

The bridge costs between $5,595 and $6,495, depending on configuration. It will be available in October.

For more information, contact Andrew Corp. at (213) 320-7126. ⓩ

Link Notes

can be used with any 802.5-compliant token-ring device.

For more information, contact ODS at (214) 234-6400.

David Systems, Inc. last week rolled out the VolksNet miniHub, a low-end addition to its VolksNet product line.

The new hub is a nine-port 10Base-T device that comes in two versions: the Model 6350-00, which provides nine 10Base-T connections, and the Model 6351-00, which offers eight 10Base-T ports and one 10Base2 port.

Among the miniHub's features is a built-in uplink port that can be used to daisy-chain several miniHubs, and 20 LED indicators, which provide information such as port status.

Both models will be available next month, and each will cost $595, or $66 per port. For more information, call (408) 720-8000.

Newport Systems Solutions, Inc. last week reduced the prices of its Ethernet LAN²LAN/Mega family of T-1/E-1 routers for NetWare by as much as 50%.

The price of the two-port LAN² LAN/Mega router for NetWare, which supports speeds from 9.6K to 2.048M bit/sec, has been reduced from $4,995 to $2,490.

The data compression version of that router has been reduced by $400, from $3,495 to $3,095. The data compression module daughterboard for field upgrades to the LAN²LAN/Mega router are now priced at $795, down from $1,195.

For more details on the reductions, call Newport Systems at (800) 368-6533.

Eagle Technology has introduced its new NE32HUB family, a series of managed Extended Industry Standard Architecture-bus hub cards that allow a NetWare file server to function as a 10Base-T hub.

The NE32HUB-Base card combines a 32-bit network interface card with a 12-port hub. The server's functionality can be extended through NE32HUB-TPE cards, which provide an additional 12 ports. As many as nine TPE cards can be used in the server, for a total of 120 10Base-T ports.

The NE32HUB-PME card provides an optional attachment unit interface/BNC backbone connection.

The Base, TPE and PME cards are priced at $840, $640 and $99, respectively, and will be available next month. Call Eagle at (800) 733-2453 for more details.

Gandalf Technologies, Inc. has begun shipping its low-cost LANLine 5220 Ethernet bridge.

The local and remote bridge provides dual wide-area network links and a data compression ratio of up to 8-to-1. Optional dual load-balancing compression WAN links provide effective throughput of up to 1M bit/sec, using two standard 64K bit/sec digital circuits.

As a local bridge, LANLine 5220 provides filtering and forwarding at Ethernet's wire speed of 14,880 packet/sec. It is equipped with a filter table that manages up to 2,000 Ethernet addresses.

The bridge supports the IEEE spanning tree algorithm and the Simple Network Management Protocol.

It is available in two versions: the $2,295 stand-alone unit and the $2,095 PC card.

For more information, contact Kerry Hawkins at (800) 354-4224. ▨

Datability targets internet market with bridge/router

By Skip MacAskill
Staff Writer

CARLSTADT, N.J. — In a move to expand its customer base, terminal server maker Datability, Inc. has entered the internetwork market with an Ethernet bridge/router targeted at work group and departmental environments.

The first product in the new Datability Internetworking Architecture (DXA) line is the DXA-550 Bridge/Router, which was jointly developed with Clearpoint Research Corp. and has been well received by early users.

The next offering will be a token-ring bridge/router that is expected to be available in the first quarter of 1993. The company declined to provide any further details on that product.

The DXA-550 is a Reduced Instruction Set Computing-based bridge/router with two thin-wire Ethernet ports and one wide-area network port that supports a variety of interfaces, including RS-232, RS-422, RS-449, EIA 530 and V.35, at speeds up to 256K bit/sec.

It has a 120M bit/sec bus and is based on Advanced Micro Devices, Inc.'s 16-MHz AMD 29000 RISC processor chip.

According to Ron Howard, president and chief executive officer of Datability, the DXA-550 has a filtering rate and forward-

> The DXA-550 has a forwarding rate when bridging of 15,000 packet/sec.
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ing rate when bridging of 15,000 packet/sec using 64-byte packets. When routing, the filtering rate is 8,054 packet/sec.

The product supports the Transmission Control Protocol/Internet Protocol, Novell, Inc. Internetwork Packet Exchange

Introducing NETBuilder combination of power.

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NETBuilder II

to the muscle of a RISC processor. And imagine, too, a bandwidth capability wide enough to handle the bulge of multimedia data.

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(IPX) and Xerox Corp. Xerox Network Systems protocols. Digital Equipment Corp. DECnet support is expected by the first quarter of next year.

Also, the DXA-550 supports the Routing Information Protocol and the Spanning Tree Algorithm, with Open Shortest Path First capabilities and source routing transparent support expected in the first-quarter 1993.

Support for Systems Network Architecture is in development and expected sometime next year.

The bridge/router comes equipped with the Datability Network Control program, which is Simple Network Management Protocol-based net management software that can be controlled from any third-party SNMP management system.

Tim Belek, systems and network administrator for the American Academy of Pediatrics in Elk Grove Village, Ill., and an early user of the DXA-550, has been employing the product to allow his 200 PCs to access core applications from a Unix server.

"The PCs definitely had a marked increase in performance," he said.

The DXA-550 is available now and costs $4,999. ⚡

Netronix to make its mark
vices that use a Texas Instruments, Inc. chipset, according to the company.

In addition to support for the Simple Network Management Protocol, the bridge/routers run Netronix's IBM LAN Network Manager-compliant software that enables users to control the units from IBM's LAN Network Manager.

Support for SNMP and LAN Network Manager is important for users with networks comprising Ethernet and token-ring LANs. These users can employ an SNMP management station to control the Netronix bridges along with other Ethernet-attached devices while simultaneously monitoring Netronix and other token-ring nodes using LAN Network Manager.

Bill Rosenberger, Netronix's president and chief executive officer, said the vendor will add support for Ethernet and Fiber Distributed Data Interface in the bridge/routers by early next year.

The TokenMaster 5000 is priced at $5,990, comparable to the low-end multiprotocol bridge/routers recently announced by Cisco Systems, Inc. ("Cisco unveils flashy lower end routers," *NW,* Aug. 10). The TokenMaster 1000 costs $2,990, which is one of the lowest prices for a multiprotocol bridge/router.

Both will be available in October.

Rosenberger said the company will also be adding routing capabilities to its existing TokenMaster 2000 local and TokenMaster 4000 remote token-ring bridges, and has dropped its pricing on those products by nearly $1,000 to $4,690 and $4,990, respectively. An optional redundant power supply is available on both models for $400.

For more information, contact Netronix at (707) 769-3300. ⚡

> The bridge/routers run Netronix's IBM LAN Network Manager-compliant software.
>
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Netnotes
ware-only version will cost $4,532, while versions including controllers and disk drives start at $9,867.

TERA Technologies, Inc. last week brought out Network PC Access (NPA), a software package that lets users of X Window System-based Unix workstations remotely access DOS-based personal computers and peripherals, as well as services and data residing on DOS-based network file servers. The package also provides the same access from DOS-to Unix-based machines.

The NPA software comes in client and server portions. The client portion can reside on either a Unix-based workstation, providing access to a DOS-based PC, or on a DOS-based PC, providing access to a Unix-based workstation.

The server and client portions communicate using the Transmission Control Protocol/Internet Protocol. Therefore, the package works with virtually any PC-based TCP/IP software, such as SunSelect's PC-NFS or Novell, Inc.'s LAN WorkPlace for DOS.

NPA is available now, priced at $495 for the server software, $195 for each version of the Unix software and $95 for each version of the DOS client software. TERA Technologies is based in Beaverton, Ore.

Novell, Inc., Cisco Systems, Inc., SynOptics Communications, Inc. and **Stony-Brook Technologies, Inc.** will host a symposium next month on enterprise network management under Novell's NetWare Management System (NMS) umbrella.

The symposium will have presentations on the architecture of the NMS platform, its evolution and management of third-party devices under NMS. Included will be management of hubs and multiprotocol router-based wide-area networks.

There will also be exhibits from vendors developing products on the NMS platform as well as hands-on demonstrations of local-area network and WAN management under NMS.

The symposium will be held Sept. 29 at the New York Hilton at Rockefeller Center.

For more information or to register, contact Beth Johnston of StonyBrook Technologies at (515) 567-6060. ⚡

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T-1 equipment sales skyrocket

LAN interconnection applications driving strong growth in T-1 muxes, DSU/CSUs and inverse muxes.

Year	Units (In thousands)	Revenue (in billions of dollars)	Revenue growth
1991	132.6	$0.97	—
1992	149.7	$1.05	9.1%
1993	170.6	$1.17	10.4%
1994	196.7	$1.30	11.1%
1995	229.5	$1.45	12.2%
1996	271.8	$1.65	13.3%
1997	329.1	$1.90	15.0%
1998	409.5	$2.22	16.9%

SOURCE: MARKET INTELLIGENCE RESEARCH CORP., MOUNTAIN VIEW, CALIF.
GRAPHIC BY TERRI MITCHELL

Regulatory Update

The **Federal Communications Commission** last week rejected **Bell Atlantic Corp.**'s request for permission to price its Flexible Automatic Number Identification (Flex ANI) service as a separate, nonrecurring charge under its Feature Group D tariff.

The FCC turned down a waiver request submitted last January and told Bell Atlantic it can file for its new Flex ANI service in two sanctioned ways: as a free option under its ANI tariff or as a basic service element (BSE) in its Open Network Architecture (ONA) filing.

Pacific Telesis Group has already tariffed a similar service under the free-option plan, while **Ameritech** and **US West Communications, Inc.** chose the other alternative.

The FCC's decision means Bell Atlantic cannot offer Flex ANI to customers until it presents a tariff plan acceptable to the FCC.

In the telephone company end offices where Flex ANI is available, the local exchange carrier can add indicator digits to incoming ANI calls so that the ANI subscriber — whether an interexchange carrier or a large corporation — can gather further information used to

InteCom positions PBX for new internetworking role

Adds LAN adapters, bridges and FDDI wares.

By Skip MacAskill
Staff Writer

ALLEN, Texas — Intecom, Inc. last week added FDDI, network management and bridging capabilities to its PBX in an effort to reposition it as the central networking device in the wiring closet.

The suite of new products, which the company has collectively dubbed InteLAN, comprises local-area network adapter cards, including an Ethernet bridge card and a 10Base-T Ethernet hub card, a Fiber Distributed Data Interface module, four-port fiber hub and net management firmware.

Past lessons

Learning its lesson from a failed effort to mesh data communications and private branch exchange features across the same switch in the early 1980s, Intecom is offering these cards as an adjunct inside its PBX and targeting the implementation to its installed base.

"This is different from five years ago because it isn't going through the switch," said Al Lill, vice-president of Gartner Group, Inc., a consultancy in Stamford, Conn.

Because the new cards are designed to fit into the PBX and can reside next to existing trunk cards, the company contends that users can create a high-speed LAN at less expense than building

an independent net since they are avoiding the cost of separate hubs, modules and bridges.

Net management woes will also be eased because the voice and data networking equipment reside in the same device.

Included among the new products is the InteLAN Ethernet Bridge Card (EBC), which comes equipped with three local 802.3 Ethernet ports, three FDDI ports, two T-1 links and 24 10Base-T ports. Data can be bridged from one port to any other.

According to Intecom, the local Ethernet bridges provide a filtering rate of 14,880 packet/sec, a forwarding rate of 10,500 packet/sec and an aggregate throughput of 34,800 packet/sec.

The filtering rate of the FDDI bridges is 420,000 packet/sec, while the forwarding rate of the two T-1 links is 3,300 packet/sec.

The bridges support the standard net protocols, including the Transmission Control Protocol/Internet Protocol, DECnet and Novell, Inc.'s Internetwork Packet Exchange (IPX). They also support the Spanning Tree Algorithm and source routing transparent.

The EBC comes equipped with an InteLAN FDDI Dual Attached Station Module in the form of a daughterboard, enabling the user to link multiple bridge cards to a 100M bit/sec FDDI backbone.

Ascend fleshes out its inverse mux line

Intros high- and low-end wares, claims industry's first leased and switched 56K-compatible model.

By Bob Wallace
Senior Editor

ALAMEDA, Calif. — Ascend Communications, Inc. last week announced several products that expand its line of inverse multiplexers at both the high and low end, with models that support between two and 26 device ports.

Ascend said one of the additions to its Multiband access equipment line — the Multiband Plus 56 — is the first inverse multiplexer in the industry with support for both leased and switched 56K bit/sec services.

Ascend also introduced the Multiband MAX, an inverse mux that supports up to 26 host ports; the Multiband VSU, a low-end inverse mux for video applications; and the Multiband RPM, a port extension device.

The products can use the pro-

prietary Ascend Inverse Multiplexing protocol or a protocol developed by the Bandwidth-On-Demand Interoperability Group (BONDING). Both are schemes for inverse multiplexing, a process by which the devices synchronize multiple switched or leased circuits to form a single, larger pool of bandwidth.

The Ascend inverse multiplexers also support three or more dialing methods — RS-366 for videoconferencing, V.25bis for local-area network interconnection and basic dialing for other applications.

Ascend's new Multiband MAX is a bandwidth-on-demand hub capable of supporting 26 host ports and four network trunks with a total aggregate trunk capacity of 8M bit/sec using T-1,

U.K. carrier gives rebates for outages

By Bob Wallace
Senior Editor

LONDON — Mercury Communications, Ltd. last week said it is offering a new Service Reliability Guarantee under which it will give users rebates for service interruptions.

Mercury's guarantee covers 2M bit/sec private-line service and comprises two parts: the Circuit Failure Rebate and the Circuit Availability Rebate.

Circuit Failure Rebates start at 10% of the annual rental charge if a user experiences up to three qualifying outages per year and go as high as 100% for six or more outages in one year, according to a Mercury spokesman.

Qualifying outages are those in which service is lost for more than five hours. Users that claim these rebates will typically be reimbursed in the following quarter's bill.

Shorter duration outages are covered under the Circuit Avail-

ability Rebate, which entitles users to a 10% rebate of a quarter's rental charge if overall availability falls below 99.5%.

The Service Reliability Guarantee initially applies only to private 2M bit/sec links because these carry the most outage-sensitive applications, the spokesman said.

Analysts hailed the announcement of the plan but stressed that such arrangements need to be adopted by more foreign carriers and offered across entire service families. U.S. carriers already provide similar guarantees.

"Users will like the practice of getting rebates when service is knocked out," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "They'll love it so much that they'll want it from all their service providers."

Mercury plans to extend the Service Reliability Guarantee in the next year to cover other network services but did not specify which ones. The carrier offers a wide variety of data networking services.

Mercury is a wholly owned subsidiary of Cable & Wireless PLC and is licensed as a public telecommunications operator in the U.K. ▨

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For additional show information, contact Jodi Levine, Show Manager, at 201-346-1400 or Fax 201-346-1602.

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NP7100 Shown

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- 24 Channel Real Time Display
- T1/V.35/Voice Drop Interfaces Standard

PC45 Shown

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For further information, please call your local representative or call NCC at 1-800-451-1984. Or check the appropriate boxes, fold with the business reply side out, tape (do not staple) and mail.

Worth Noting

"Organizations are unlikely to be 100% Windows, so a group scheduling package that doesn't include DOS is brain dead."

Bernd Hartzog
Senior analyst
Gartner Group, Inc.
Stamford, Conn.

Store & Forward

Levit & James, Inc. recently announced Version 3.0 of its Mass Transit software product, which lets users convert word processing documents from Wang Laboratories, Inc. Wang VS systems to a variety of personal computer-based word processing formats.

The software includes an expanded search and selection option for Wang VS documents, a new scripting language for converting and transferring documents, and enhanced auditing capabilities.

The product, which is priced between $2,000 and $6,000, depending on the processor and options, is available now. For more information, call (703) 771-1549.

Start-up **Bliss Communications** recently introduced a message switch for small companies or departments within large firms that want messaging capabilities but do not want to install a local-area network, mainframe or minicomputer. The Bliss Communications Message Center provides store-and-forward messaging for asynchronous devices.

An eight-port unit with 2M bytes of main memory and a 125M-byte hard drive costs $3,495. For more details, call (908) 223-0066.

Pioneer Software releases improved data access tools

Introduces two products at recent conference.

By Wayne Eckerson
Senior Editor

BOSTON — Pioneer Software recently announced a new version of its data access tool for Windows and OS/2 applications, as well as a new data access tool for applications built with Borland International, Inc.'s Visual Basic programming language.

Both announcements were made at the third annual summer Windows and OS/2 Conference here.

Version 5 of Pioneer's Q+E Database Editor data access tool supports several new databases, an enhanced user interface and improved reporting capabilities. Q+E Database Editor enables Windows and OS/2 users to extract and edit information from SQL and non-SQL databases and then integrate it directly into desktop applications.

Version 5 also supports IBM's Application System/400, Gupta Technologies, Inc.'s SQLBase and Tandem Computers, Inc. NonStop SQL databases. This boosts the total number of databases Q+E Database Editor supports to 18. Other databases include Novell, Inc.'s Btrieve and NetWare SQL, Oracle Corp.'s Oracle Server, Microsoft Corp.'s SQL Server and IBM's DB2 and OS/2 Data Base Manager.

Windows features

The Q+E Version 5 interface now supports Microsoft Windows 3.1 features, including drag-and-drop functionality, tile and cascade windows, common dialogue boxes, context-sensitive help and color text. It also includes a customizable icon bar, which enables users to execute any Q+E command with a single click on an icon and lets users customize the placement and design of fields, text boxes, command buttons and scroll bars on the screen.

The new version also contains a Query Builder tool, which enables nonprogrammers to create SQL statements by pointing and clicking on interactive dialog boxes. It also lets users create predefined queries, which makes it easier to obtain commonly requested information.

Version 5 is priced at $299 and will ship in late September.

CA reveals some elements of its CA90s architecture

By Timothy O'Brien
West Coast Bureau Chief

ISLANDIA, N.Y. — Computer Associates International, Inc. (CA) has cast the pearls of its CA90s architecture before swine, and the result is a new set of software utilities called, believe it or not, Pigware.

The swine in this case are programmers for CA's Product Integration Group, who are affectionately known within the company as "pigs." Pigs are responsible for developing the glue of the CA90s architecture, the system-level products and services that provide interoperability among CA products on various computing platforms.

The company is now making some of these facilities available at no charge to users, including a utility that provides access to CA's Event Notification Facility (ENF) and an application program interface (API) for its ViewPoint 3270 graphical user interface.

The facilities are designed to make it easier for users to develop software that interoperates with CA products.

Revealing message

At the company's System Software Conference, held recently in New Orleans, Charles Wang, CA's chairman, told 1,200 customers that the company had been urged by users to reveal certain proprietary elements of its CA90s architecture that are used throughout its multiplatform systems management products.

"Where the facilities within industry architectures or standards didn't exist to fulfill the objectives of CA90s, we built our

The ascent of multimedia networks

Emergence of networked multimedia applications and key technologies and standards supporting them.

	Technologies/standards	Applications
1990	PX64 for video	Videoconferencing
1991	FDDI	Image management
1992	Switched Multimegabit Data Service	Multimedia presentations and training programs
1993	FDDI-II	Multimedia E-mail
1994	Asynchronous Transfer Mode/Synchronous Optical Network	LAN-based desktop videoconferencing
1995	Broadband ISDN	—
1996	FDDI Follow-On LAN	—
1997	Open Document Architecture	Network-enabled multimedia

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: INFORMATION STRATEGIES GROUP, VIENNA, VA.

Managers look to multimedia future

Study urges net managers to experiment with current technology, prepare for coming hurdles.

By Wayne Eckerson
Senior Editor

VIENNA, Va. — By the turn of the century, most companies will be implementing multimedia applications that pull digitized audio, full-motion video, image and text information from distributed servers across an enterprise network, according to a new report from Information Strategies Group (ISG).

The report predicts that users will view multimedia as an indispensable tool for enhancing corporate productivity and that network-based multimedia applications will make the same inroads into corporations that desktop publishing did in the 1980s.

In order to prepare for the expected increase in demand, the ISG study urges network managers to experiment with current technology in supporting multimedia applications, such as setting up parallel networks for synchronizing the presentation of audio and video information.

Net managers should also begin planning for the conversion of current corporate networks to emerging high-speed transport facilities, such as Fiber Distributed Data Interface and Asynchronous Transfer Mode (ATM).

"With the market rapidly evolving to networked multimedia, the network manager needs to plan now to harness new and emerging products to meet application needs," said Gregory Cline, author of the report and program manager of the Communications Technology Service at ISG, a market research company located in Vienna, Va.

The report describes four applications that will fuel the growth of networked multimedia: education and training; personal communications, including electronic mail and desktop videoconferencing; kiosk and business presentations; and information repositories, such as electronic catalogs, libraries and manuals.

Cline said the network technology and standards needed to build network-enabled multimedia applications will become available in the next five years. For example, the emergence of high-speed networks based on FDDI and ATM standards will enable companies to distribute multimedia information on demand from network servers instead of physically distributing CDROMs to every desktop. This will make it easier for companies to provide up-to-date multimedia information, reduce equipment costs and save time.

Obstacles ahead

However, there are some challenges to hurdle before networked multimedia becomes possible. While compression techniques can reduce the bandwidth required for full-motion video to 1.5M bit/sec, today's networks still have difficulty supporting multimedia information because of the different way data, audio and video consume bandwidth on a network, Cline said.

Data is well suited for connectionless, packetized environments because it is bursty by na-

Promptus, Tellabs team in bandwidth-on-demand game

By Bob Brown
Senior Editor

PORTSMOUTH, R.I. — Promptus Communications, Inc., based here, and Tellabs Operations, Inc. have signed a tentative agreement to jointly build and market bandwidth-on-demand products.

Under the relationship, the companies will build inverse multiplexer technology into Tellabs' T-1 muxes. Also, they will work together to address high-speed data applications requiring dial-up bandwidth for disaster recovery, videoconferencing and local-area network interconnection.

A definitive agreement is expected to be signed by October.

Initially, Promptus' technology will be used to enhance Tellabs' Crossnet series of digital multiplexers with support for T-1, E-1 and Integrated Services Digital Network access to switched service offerings.

The companies will jointly develop an adjunct device to the Crossnet multiplexers that will be based on Promptus technology, said Jim Dolce, vice-president of marketing at Promptus.

The multiplexer and adjunct devices will be manageable under a Tellabs management system, but further details were not available, according to a Tellabs spokeswoman.

Tellabs and Promptus have pledged to make this solution adhere to the proposed Bandwidth-On-Demand Interoperability Group (BONDING) inverse multiplexing standard. The offering is due out by year end.

The agreement between Promptus and Tellabs will also include a provision for Tellabs to resell Promptus' existing line of products under its own label. The companies will also undertake other codevelopment work, which will be detailed later.

Tellabs, based in Lisle, Ill., makes and sells multiplexers for private net users and carriers. According to Dolce, the agreement between Promptus and Tellabs will open up a new market — the carrier market — for Promptus and help expand its customer base. **Z**

Filing makes users wary

ware and services company and "scale back" equipment manufacturing.

Konopka does not find that particularly reassuring. "I need hardware, too," he said.

Wang's promise that service and maintenance will not be affected and that software upgrades will be released on time must be backed up by action or the company will lose even its most loyal customers, Konopka said.

"It's nice to be loyal, but I have a business, too. If I can't look my CEO in the eye and tell him a company will be around in five years, I'll have to go out and get a different vendor." It is not clear whether Wang will be here in five years, he noted.

Vendors are also pondering their relationships with Wang, a systems integrator in both the commercial and government markets and a major reseller of networking products. Wang's Chapter 11 bankruptcy filing puts Wang's dealings with its creditors in the hands of the Bankruptcy Court for the District of Massachusetts in Boston.

"We don't know what the courts will allow them to pay their creditors," said Peter Hamilton, president of Banyan Systems, Inc. Wang now accounts for one-tenth of all VINES sales, he said. There is little outstanding debt remaining with Wang, but Banyan is now forced to reevaluate its long-standing relationship with Wang in terms of financial risk.

Hamilton said Banyan intends to offer Wang customers with Banyan products support "no matter what the outcome of the bankruptcy" proceeding.

Peter Troop, a spokesman for Novell, Inc., labeled Wang one of Novell's biggest resellers, adding that Wang is a "creative and capable systems integrator." But he acknowledged that Novell's "financial department is evaluating the risk. We don't give credit to people that represent a high risk."

Looking to the future

During the bankruptcy announcement, Wang tried to assure customers that it would move ahead with its product plans.

For example, the company confirmed its intent to deliver OPEN/Image imaging software for the IBM RISC System/6000 workstation by the promised delivery date of September.

Called OPEN/Image for AIX, the software supports the application program interface used in all the company's OPEN/Image host imaging products, runs on Transmission Control Protocol/Internet Protocol nets and uses Microsoft Corp.'s Windows graphical user interface.

Imaging has been cited as one of the keys to Wang's future, and it is a market where the company has met with some success. The company declined to give specific revenue numbers for imaging sales, but analysts estimate that Wang generates about $100 million a year in imaging systems.

But the bankruptcy filing casts a pall over future sales of imaging systems, said Joseph Gagnon, an analyst with Ernst & Young's national image consulting practice in New York. He predicted that OPEN/Image for AIX will not sell until Wang management has "convinced the world they have a vision."

According to Gagnon, Wang entered the imaging field early in 1987, and in 1990, shared the No. 2 sales spot with competitor FileNet, Inc., with IBM as market leader.

Looking to the future

> ❝**I**t's nice to be loyal, but I have a business, too," Konopka said.
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But the bankruptcy filing casts a pall over future sales of imaging

But, he said, Wang's share of the growing $1 billion imaging market is dwindling because it did not do enough to cultivate support of third-party software providers.

Today, Dallas-based Plexus, Inc., a new player in the imaging business, is overtaking Wang, Gagnon said. "Customers keep calling up and asking, 'How can I buy Wang when they're failing?'" he said. "If they could focus on one or two things and do it well, it would convince me."

Other analysts also expressed skepticism about a Wang comeback. "It's a tough battle to fight," said John Dunkle, an analyst with Workgroup Technologies, Inc. in Hampton, N.H. He said the bankruptcy filing is a black mark on Wang's image, giving the impression the company is already an also-ran.

"They have to come out of bankruptcy in six to nine months, or they're gone," Dunkle said. "The clock is running." **Z**

NIST stance fuels concern

from GOSIP Version 2, where NIST will set forth specific federal user purchasing requirements.

Many vendors seem to have been caught off-balance by NIST's National ISDN 1 rejection.

Although NIST published in the *Federal Register* notice of its intent to create a federal ISDN standard, few in the industry seem to be aware that it represents a slightly different course than National ISDN 1.

NIST's lack of support for National ISDN 1 was a surprise to many, who noted that NIST still plans to take part with other federal agencies in the National ISDN 1 event scheduled for November. As part of that event, vendors and users will support open houses to showcase their ISDN applications. The Department of Veterans Affairs, the Internal Revenue Service and the Defense Information Systems Agency will also be involved in the National ISDN 1 event.

NIST's participation in the week-long celebration of National ISDN 1 is a goodwill gesture, and Bellcore and NIST are confident that their ISDN specifications will coincide in the future.

Dealing with differences

But initial differences in the technical sets, while not viewed as significant enough to cause equipment interoperability problems, will require separate conformance testing (see graphic, page 27). ISDN customer premises equipment built to the NIST and Bellcore designs will handle status inquiry messages and error-handling procedures differently, said Laurie Izzie, Bellcore's ISDN switching director.

Vendors said the difference means they will have to build a second device that has been subjected to separate conformance tests in order to sell equipment to the federal government.

"There are costs involved," said Ed Dunlap, product line manager for digital networks at Gandalf Data, Ltd. in Ottawa, explaining that the added expenses incurred by the vendor would mean higher prices for users.

"There's no real sense in having separate specs," said an AT&T spokesman. "Our position is that the differences need to be harmonized." Gandalf and AT&T will build equipment based on the NIST standard if necessary, although they both view the divergence in the two specifications as unfortunate for users and vendors.

Same old problem

However, others shrugged off the difference as just part of the usual problem in supplying the flavors of ISDN.

"Our approach generally is we will speak whatever language necessary," said Rod Randall, vice-president of business development at Teleos Communications, Inc. He added that about 25 versions of Primary Rate Interface and BRI exist in various countries worldwide.

Fujitsu Network Systems, Inc. is planning to build its line of terminal adapters and ISDN handsets according to the National ISDN 1 specification and was unaware of the impending NIST standard. George Schlosser, a strategic analyst at UDS/Motorola, Inc., said his company is now manufacturing devices conforming to the National ISDN 1 specification.

"It's too early to consider making ISDN terminal adapters for the ANSI standards," Schlosser said. "We're not heavily involved in government business, anyway." **Z**

Industry Briefs

puter Centers, Inc., Microware Distributors, Inc., Tech Data Corp. and Vitronix Corp.

Worldwide distributors include Ingram Micro, Inc. and Merisel, Inc.

International distributors include InterQuad in France and Novell KK in Japan.

Microcom results mixed. Microcom, Inc., a Norwood, Mass., vendor of communications software and bridges, reported a net loss of $6.7 million for its first fiscal 1993 quarter ended June 30, down from earnings of $350,000 in the first quarter last year.

Microcom's earnings were negatively affected by a restructuring charge of $5.8 million to cover the write off of assets, including the company's Relay product line, and costs associated with a 15% work force reduction announced recently.

The company's revenue for the first quarter was $18.9 million, up 16% from $16.3 million in the corresponding period last year.

Novell boasts financials. Novell, Inc., a Provo, Utah, vendor of network operating system software, last week reported revenue of $243 million for its third fiscal quarter ended Aug. 1, up 45% from $168 million in the third quarter last year.

Earnings jumped 53% to $66 million for the quarter, up from $43 million in the third quarter of last year. **Z**

Manager Minutes

The EDI Group, Ltd. is sponsoring the Advanced EDI Strategies Conference, scheduled to be held Oct. 21-23 in Chicago.

The conference offers several workshops that focus on different facets of implementing electronic data interchange, including integrating EDI and electronic mail, EDI in health care, economic justification of EDI, hub implementation and EDI audits.

For more information, contact The EDI Group at (708) 848-0135.

The **Institute of Electrical and Electronics Engineers, Inc.** has issued a call for authors and reviewers to contribute to its series of practical telecommunications handbooks.

Upcoming handbooks include "Subscriber Loop: Digital," "Introduction to Signaling Systems and SS7" and "Power System Design."

Interested participants should be engineering practitioners with hands-on experience in telecommunications technology.

For more information, contact series editor Whitham Reeve, Reeve Consulting Engineers, P.O. Box 190225, Anchorage, Alaska 99519, or call the IEEE Press at (908) 526-3967. **Z**

Pricing is key to professional services buyers

What is the most important criteria for evaluating a professional services firm?

Criteria	Percentage
Price is an important consideration	68%
Prefer a fixed price	24%
Price is important, but vendor resources and commitment are more important	20%
Prefer a variable price	12%
Price is less important if a prior relationship exists	8%
Always work on a low bid*	6%
Price is more sensitive on larger jobs	4%
Always want a detailed cost breakdown	2%

* Public sector only

Responses are based on a survey of 80 companies that have used professional services in 1991 or 1992.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: INPUT, MOUNTAIN VIEW, CALIF.

Professional services firms cut prices to win business

By Joanne Cummings
Senior Writer

MOUNTAIN VIEW, Calif. — A survey conducted by INPUT, a market research firm here, shows that professional services firms are offering deep price discounts to users.

Professional services firms provide information systems departments with consulting, software development and maintenance, training and education. The survey was conducted to examine changes in the way users purchase these services.

The study found that the recession has put pressure on professional services vendors to discount prices, with firms offering price reductions ranging from 5% to 50%. Still, these vendors said they expect to increase profits an average of 13% from 1991 to 1992 and an average of 50% or better by 1994.

The report also examined key user criteria in selecting a professional services firm. It found that pricing was the most significant consideration, cited by nearly 79% of the 80 companies surveyed as important (see graphic, this page).

Respondents also listed industry knowledge, technical skills and the ability to complete a project on time as key factors in choosing a firm.

For more information or a copy of the report, contact INPUT at (415) 961-3300. **Z**

EXECUTIVE BRIEFS

EDI and the law. The Data Interchange Standards Association (DISA) and the Electronic Data Interchange Association (EDIA) jointly announced the appointment of eight commissioners to work on the groups' Datalaw Project, an initiative designed to increase commercial EDI by concentrating on drafting and implementing laws concerning electronic commerce.

The commissioners are Lance Dailey of Sears, Roebuck and Co.; John Deus of Sea-Land Corp.; Eric Dyce of the Fritz Companies; Tom McCarthy of E.I. du Pont de Nemours & Co.; Tom O'Hare of Heinz U.S.A.; Todd Ostrander of The Boeing Co.; Susan Rapp of PNC Financial Corp.; and Tim Reis of the United Parcel Service.

The commissioners will lead a task force comprising DISA and EDIA members.

For more information, contact EDIA at (703) 838-8042 or DISA at (703) 548-7005. **Z**

Telecommuting gets vote of confidence

Report finds work option could save Calif. $5b, recommends use of intelligent highway systems.

By Joanne Cummings
Senior Writer

SACRAMENTO, Calif. — The concept of telecommuting got a major boost from a California Engineering Foundation (CEF) report that claims the alternative approach to work could help California save close to $5 billion a year in fuel costs and productivity loss.

The CEF, which is run by a board that includes representatives from the American Institute of Chemical Engineers, Bechtel Industries, Fluor Daniel, Inc., Northern Telecom, Inc., Pacific Bell, Rockwell International Corp. and Xerox Corp., is dedicated to exploring the socio-economic impact of technology. The foundation's report was cosponsored by the California Department of Transportation, which has pledged to adopt the CEF's recommendations.

The report, titled "Transportation Redefined," includes recommendations for easing the strain on California's highway system and environment through telecommunications applications such as telecommuting, teleconferencing and facsimile. It also outlines the obstacles to achieving those goals.

The study recommends development of an intelligent highway system that would make traditional commuting more efficient.

According to Robert Kuntz, president of the CEF here, intelligent highway systems would incorporate several existing technologies.

For example, he cited an existing system that automatically records information about cars passing through a toll plaza without requiring commuters to stop. The system is easier for commuters, who are billed for tolls monthly, and can significantly decrease traffic congestion.

In addition, cars could be outfitted with computers that select the most efficient route to a particular destination. Route data could be automatically updated from a central location, much like flight paths are monitored and updated from a central air traffic control tower today.

A pilot project of this application is currently under way at the California Polytechnic State University in San Luis Obispo, Calif., he said.

"These technologies are available today," Kuntz said. "Unfortunately, the protocols and standardization haven't been done in this country that would make them work efficiently and become widely adopted."

As part of the report, the CEF calls on the Federal Communications Commission and other standards bodies to make these initiatives a top priority.

Kuntz said telecommuting is

Kuntz said telecommuting is often treated negatively in today's society.

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often treated negatively in today's society. For example, if employees work from home and use company-purchased equipment, such as a computer, the equipment could be considered taxable income according to new Internal Revenue Service rules.

"That's not an incentive," Kuntz said. "That's a tax insult."

In addition, he said, employees who buy their own equipment to work from home are more frequently audited by the IRS. "The IRS looks negatively on people depreciating their own equipment while receiving a W-2 form from an employer," Kuntz said.

Telecommuters also face problems with today's management philosophy. "They suffer from the 'out of sight, out of mind' syndrome," Kuntz said, explaining that telecommuting tends to impede employees' career growth because they lack the direct day-to-day interaction with a supervisor.

For more information or a copy of the report, contact the CEF at (916) 448-5411. **Z**

Ascend fleshes out mux line

fractional T-1, E-1 or ISDN Primary Rate Interface access.

Multiband MAX is a Reduced Instruction Set Computing-based unit with two synchronous host I/O ports that operate at up to 1.544M bit/sec, plus two network trunks that connect to Nx56, Nx64 and Nx384 offerings, and switched 384 and switched T-1 services as well as ISDN Multirate services.

Each of the Multiband MAX's six expansion slots can house a four-port host interface card, which means the unit can handle 24 additional host interfaces.

Multiband MAX host I/O modules support V.35, RS-449/RS-422, RS-530 and X.21 interfaces.

At the low end, Ascend's new Multiband VSU is a two-port video service unit that supports 112K bit/sec or 128K bit/sec links for videoconferencing using dedicated or switched 56K bit/sec and ISDN Basic Rate Interface (BRI) connections.

The Multiband VSU is field-upgradable to support 392K bit/sec of bandwidth. Standard Multiband VSU features include RS-366 and X.21 dialing.

The Multiband VSU interoperates with all other Multiband products and with inverse multiplexers that support the BONDING specification.

Ascend also announced the Multiband Plus 56, a new model of the vendor's Multiband Plus inverse multiplexer that will enable users to dial up multiple switched 56K bit/sec links from AT&T or Northern Telecom, Inc. central office switches.

The Multiband Plus 56 can be configured with four network interfaces with an aggregate bandwidth of 224K bit/sec or seven interfaces to support an aggregate bandwidth of 392K bit/sec. The unit can be equipped with two or four host ports.

Ascend also introduced the Multiband RPM, a port extension device that enables users to extend by 1,400 feet the distance between any Ascend product and attached hosts, coder/decoders or other equipment.

Each Multiband RPM supports a total of 1.5M bit/sec of bandwidth or two simultaneous applications at 768K bit/sec each.

Users can configure the RPM, set up and store call data, allocate and control bandwidth, and perform diagnostics from an attached Ascend Palmtop terminal or a Digital Equipment Corp. VT-100 terminal.

Pricing starts at $15,000 for the Multiband MAX, which will ship in December. The Multiband VSU, supporting two switched 56 network ports and 112K bit/sec net bandwidth, will be available in October. A second model of the unit with one ISDN BRI port and 128K bit/sec bandwidth is available now. The models cost between $4,500 and $5,000 each.

Pricing will run from $5,000 to $13,000 per unit for the Multiband Plus 56, which will be available in October. The Multiband RPM is available now at $1,500 each and $2,750 for a pair. **Z**

Firm positions PBX for role

Available now, the EBC costs $15,000.

The InteLAN Ethernet Hub Card (EHC) can support 32 10Base-T connections and can be linked to the EBC via an unshielded twisted-pair link. As many as 120 end-node connections can be supported by a single EBC card if all three of its local bridges are used to support attached EHCs.

The EHC is priced at $4,000 and is available now.

The bridge and hub cards are each powered by two Texas Instruments, Inc. C40 Reduced Instruction Set Computing processors operating at 25 million instructions per second.

The EBCs and EHCs are also hot-swappable.

The cards are outfitted with IQ Manager, which is Simple Network Management Protocol-based firmware that allows the cards to be managed by Hewlett-Packard Co.'s OpenView or any other SNMP-based management system.

According to John Nagley, a member of the technical staff at Sandia National Laboratories in Albuquerque, N.M., where the EBC and EHC are in beta test, the facility will use InteLAN to build a metropolitan-area network comprised of a series of LANs.

"Because of the security concerns of being a national lab, we partition the network into small LANs," he said. "Because it's early in the testing, we're using Inte-LAN in a limited capacity, but it's worked fine thus far."

In order to extend the capabilities of the EBC and EHC to remote work group and departmental LANs, Intecom is also offering the Fiber LAN Distributed Interface (FLDI) 1000.

Available now for $15,800, the FLDI 1000 is essentially a wall-mounted minihub linked via fiber to the PBX, which can be up to two kilometers away. It comes with an EBC and can support 24 10Base-T connections and three Ethernet segments.

In the first quarter of next year, Intecom will introduce a token-ring bridge card and a token-ring version of the FLDI.

According to David Tucker, director of marketing at Intecom, this is the first step in a migration plan to offer Asynchronous Transfer Mode (ATM) capabilities.

"Instead of asking users to toss everything out the window when ATM arrives, we want to provide a migration to an integrated communications architecture that will merge technologies into a manageable enterprise-wide network," he said.

A Synchronous Optical Network interface, the first piece of Intecom's ATM strategy, is expected in first-quarter 1993. **Z**

CA reveals some CA90s elements
continued from page 25

own services to provide that additional functionality,'' explained Mary Welch, vice-president of CA, located here. "Now, through Pigware, we're allowing some services to be used by clients."

Through the release of Pigware, users gain an interface to various high-level services such as ENF, which enables management or business applications to exchange event information. For example, ENF would enable an application to issue event information to a security system.

As a result, it is now possible for users to build custom utilities or applications that take advantage of services such as ENF without programming at the more complex operating system level.

Initially, Pigware is only available for the host-based MVS operating system.

However, during the next 18 months, CA plans to make this software available for many of the other platforms it supports, including Unix.

During the same period, CA plans to provide to users its Common Communications Interface, which facilitates information sharing across platforms by insulating applications from underlying communications protocols.

Opening up the API
As part of this announcement, CA has also agreed to open up the API associated with CA's ViewPoint interface program to help users build applications employing the ViewPoint interface that works with other CA90s-based products and other ViewPoint-based applications.

Also, CA said it will make its systems management products compliant with IBM's OS/2 Distributed Systems Management architecture for the local-area network environment.

At the conference, CA also updated customers on various partnership programs. Several of these programs — such as the Development Partner Program and the Business Partner Program — call for CA to assist third-party developers or value-added resellers in building CA90s-based software, which CA will then help market.

In addition, CA is introducing a Consultant Relations Program in which CA will offer customers additional support personnel to help implement software built on CA90s. ⊡

Managers look to multimedia
continued from page 25

ture and does not require packets to arrive in sequence. Audio and video, on the other hand, require steady high bandwidth (16K to 384K bit/sec) for the duration of a session and packets that arrive sequentially.

The report says FDDI-II offers one solution to this dilemma because it supports high-speed packet switching for digital data, and isochronous or time-dependent circuit switching for audio and video. Once users build FDDI-II networks, they will use FDDI Follow-On LAN standard being developed by the ANSI X3T9.5 committee to interconnect those nets.

Besides FDDI technologies, Cline said ATM will offer the best support of multimedia applications. ATM supports fixed-length cells and speeds up to 1G bit/sec, as well as connectionless channels for data and connection-oriented channels for audio and video.

Another problem facing networked multimedia is synchronizing video and audio segments. Most users today run parallel networks in which data, video and audio run on separate networks.

The reports also said that toward the end of the decade, many companies will run multimedia applications across public networks that support broadband Integrated Services Digital Networks or other broadband services.

The report is available for ISG clients. ⊡

Pioneer Software releases tools
continued from page 25

Pioneer also announced Q+E DataLink/OV software, which links Windows applications built using Borland's ObjectVision Visual Basic to a variety of SQL and non-SQL databases.

Same roots
Q+E DataLink/OV is built on the same technology that Pioneer uses for its Q+E Database Editor data access product. The offering enables ObjectVision developers to create Windows applications that can access data from any database supported by Pioneer's Q+E Database Editor, including those from Gupta, IBM, Novell, Oracle, Sybase, Inc., Tandem and others.

Currently, ObjectVision offers links to Borland's own database systems, dBASE and Paradox. Also, Borland sells a software add-on to ObjectVision called SQL Connect that provides access to Sybase and Oracle databases. It sells for $795.

In contrast, Q+E DataLink/OV supports many more databases, costs $299 and can be distributed royalty-free.

Q+E DataLink/OV provides database access via a set of existing ObjectVision functions that perform database operations, such as updating and deleting database records. The product lets users access data from different databases without having to change the ObjectVision application.

Q+E DataLink/OV, which will ship in October, can only be used with Windows applications. The company plans to issue an OS/2 version if there is sufficient demand. ⊡

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OPINIONS

Microsoft-Apple deal makes everyone a winner

When Microsoft Corp. and Apple Computer, Inc. agreed last July to endorse each other's database access specifications, everyone concerned came out a winner, including the two firms, their users and independent software vendors (ISV).

Under the agreement, Apple will add support for Microsoft's Open Database Connectivity (ODBC) application program interface (API) to its Macintosh Data Access Manager. Additionally, Apple will develop software that will automatically translate ODBC calls generated by Microsoft Windows applications into Apple's Data Access Language (DAL) requests.

This means users of Windows- and Macintosh-based client applications will have access to a broader range of server-based relational database management systems. It also means developers can more easily build these applications, and Apple and Microsoft will win points for providing interoperable database access products.

> **B**oth companies understand that desktop users don't want to see networks.
> ▲▲▲

ODBC is the database access component of Microsoft's Windows Open Services Architecture, which is designed to hide from developers the complexities of network computing. DAL is Apple's method for enabling Macintosh clients to tap into data stored on systems running DAL server software.

The addition of an ODBC/DAL driver for Windows and Macintosh guarantees that any program that includes ODBC API calls can transparently access any of the dozen relational DBMSs supported by DAL servers.

The rapid acceptance of ODBC means Microsoft will soon be able to deliver an ODBC API for its SQL Server, Oracle Corp.'s Oracle Server, DAL servers and Information Builders, Inc.'s Enterprise Data Access (EDA)/SQL — providing Windows or Macintosh clients with access to virtually all major databases.

The inclusion of EDA/SQL is especially important because it provides ODBC clients with transparent access to DBMSs defined as part of IBM's Distributed Relational Database Architecture, including DB2, SQL/DS, OS/400 Database Manager and OS/2 Extended Edition Database Manager, as well as numerous legacy DBMSs and file systems.

The agreement clearly establishes ODBC, which is a superset of the SQL Access Group Call Level Interface, as the de facto standard API for interoperable database access. This is critical for persuading ISVs and in-house developers to write to the ODBC set of API calls instead of using proprietary or alternative SQL APIs.

With ODBC, Microsoft has pulled together a very attractive API that will enable ISVs and in-house developers to build client/server database applications that can be DBMS independent. Apple is smart to jump on the ODBC bandwagon. Both companies understand that desktop users don't want to see networks and servers. ODBC helps make these components transparent by masking the complexities of communicating with back-end relational database servers and greatly simplifying access to enterprisewide data. ⊠

Tash is president of Database Decisions, a consultancy in Newton, Mass., and a division of Hewitt Associates.

EDITORIAL

In praise of the network industry's unsung heroes

> "They laugh that win."
> From Shakespeare's *Othello*

While this unabated recession has put the squeeze on staff and budget expansion, it hasn't slowed demand for network services and applications that cut costs or improve productivity.

Corporate management and end users don't want to hear how much pressure you're facing. Do more with less, press the vendors for concessions, don't count on a big pay hike, hold off on filling that position, hit the deadlines. Thankless stuff.

The need for net innovation has never been greater, but these times, they do try your soul (adversity, the test of strong men, necessity, the mother of invention, and all that). There are lots of opportunities for extra work but few for recognition, it seems. Here's one: our 8th Annual User Excellence Awards.

8th Annual User Excellence Awards

The idea behind the awards is to recognize net professionals for the innovative application of network products and services, and to honor users that have reshaped their businesses through networking.

We've honored some giants, including American Express Travel Related Services Co., Sears Technology Services, Inc., Texas Instruments, Inc., American Airlines, Inc. and Decision Technologies, Inc.

But awards have also gone to smaller organizations, such as Boston's WNEV-TV, the University of California at San Diego, Unified School District 259 of Wichita, Kan., and Virginia's Prince William County.

You see, the size of your net staff or budget isn't the issue. Innovation is the key, and no one has exclusive rights to that.

All year long, you've worked hard to keep everyone else online. Now do something for yourself. Fill out the form on page 18 and get some recognition. If you need more information, get in touch with us at (800) 622-1108.

Go on, you've earned it. ⊠

Blueprint glut is a huge error

The Final Jeopardy theme woke me from a restless sleep during which I dreamed I was a network manager trying to understand what the hell all the fuss was about frame relay.

I threw on my tweed jacket and raced down to the exhibit floor of the LANs, WANs and Automobiles '92 for my appointment with the top muckety mucks of Huge Computer Co. A marketing rep who looked like Vanna White ushered me into a private meeting room of the firm's 14-story display booth after jamming a Huge Computer pen, lapel button and carryall sack into my sweaty hands.

Then in walked Huge Computer's VP of sales, marketing and office supplies, along with 11 other subexecs nattily attired in Brooks Brothers suits and gleaming wing tips.

"Troy," the VP intoned. "To-day, we're announcing major enhancements to our ONEWICA platform that we believe best position us as a solutions supplier to users with network needs."

"What the hell is that?" I queried insightfully.

"Troy, I'm talking about our Open Network Enterprise-Wide Infrastructure Communications Architecture," the VP rolled on. "It's our approach to seamless, enterprisewide, transparent, client/server, manageable communications platforms for application-independent computing environments."

So, the bigwig informed me, Huge Computer announced ONEWICA two years ago to explain to its customers why it couldn't make any of its products work together and how everything would be hunky dory in the "very near future."

"What products are you an-nouncing?" My journalistic instincts were razor-sharp.

"Products? Products are old hat," the VP uttered. "We're so busy expanding ONEWICA, we don't have time for products. Besides, users want blueprints, not products."

"But what about your rivals?" I was digging deep.

"Troy, no one has an open network blueprint like ours," Mr. VP droned. "When it comes to architectures, we're the master builders. We'll match our ONEWICA against any set of acronyms and come up a winner."

The VP pumped my hand and gently but firmly shoved me out into the mass of humanity grabbing gimcracks from the vendor booths. Time to go back and file a 20-inch story on ONEWICA. ∎

Hubris is a free-lance network journalist.

The Network Manager's Handbook: Rule 75

Good managers welcome the opportunity to share control by empowering their employees.

"Alice, you're in charge of the lights tonight."

Phil Frank

LETTERS TO THE EDITOR

Patent problems

Kudos to Ellen Messmer for her informative analysis of the issues clouding public-key cryptographic standards ("NIST stumbles on proposal for public-key encryption," *NW,* July 27).

The conflict between the National Security Agency and the National Institute of Standards and Technology (NIST) Messmer described shows how the government can provoke patent litigation, which is certain to cripple any standards before they can be implemented.

Public-key technology is founded on the pioneering work of Professor Marty Hellman, Bailey Diffie, Ralph Merkle, Ronald Rivest, Adi Shamir and Leonard Adelman. Their patents, issued to Stanford University and the Massachusetts Institute of Technology, are the seminal patents in this field, covering all known methods of practicing public key.

With the agreement of Stanford University and MIT, my company, Public Key Partners (PKP), offered in April 1990 to license these fundamental patents as part of a national standard. Surprisingly, no response to this offer was ever received.

Instead, in order to justify its rejection of the de facto standard based on the work of Rivest, Shamir and Adelman, NIST has taken the public position that the Digital Signature Standard (DSS), a variation on the work of Professor Hellman's graduate student, Taher El Gamal, is "royalty-free." This position is rationalized by two strains of disinformation: first, that NIST's ability to obtain its own patent for DSS somehow makes it royalty-free and, second, that the university patents do not cover DSS.

The existence of a patent does not make the art royalty-free from the rights of other patent holders. As for NIST's ostrich-like contention concerning patent coverage of DSS, PKP has successfully litigated and settled cases concerning the unauthorized practice of El Gamal's signature schemes.

By taking an adversarial position with the investors and denying them recognition for their inventions, NIST is leading the unwary into a legal mine field. The patent holders will be forced to assert their legal rights and,

by doing so, reluctantly serve the interests of those who secretly prefer to deter cryptographic standards from commercial use.

Robert Fougner
Director of licensing
Public Key Partners
Sunnyvale, Calif.

PUC blockade

I agree 100% with James Carlini's assessment of public utility commissions (PUC) in his column "Let's cut the strings on state 'puppet' utility commissions" (*NW,* June 29). PUCs do get in the way of the introduction of new technologies.

I disagree, however, with Carlini's solution, which was to appoint technically knowledgeable people to the PUCs. The solution is not to create a technocracy. Technocrats are subject to politics and special interests resulting in the slowing or outright prohibition of the introduction of new technologies.

What's needed is a free market in the telecommunications industry. To that end, the solution is to get rid of the PUCs altogether. The PUCs have never been needed by anyone other than the utilities to maintain their monopolies, the lawyers to

fight expensive lawsuits, the politicians to enhance their power and numerous special interest groups.

Chuck Wright
Louisville, Colo.

The onus of testing

It was with great interest that I read the article by Joanne Cummings headlined "Multivendor net challenge starts just as you finish" (*NW,* Aug. 10). Her observations and the quotes from various managers of multivendor systems highlight the problems facing every network manager whose application or budget does not allow for a single-vendor approach.

However, some of the proposed remedies, such as the establishment of an in-house testing center, seem somewhat drastic. And even if it is still less expensive than a one-vendor system, this approach is impractical for most small and midsize companies.

Testing new products is regrettably often necessary, but who is going to do it? Users are unwilling to experiment with new products in their networks because they may create as many problems as they resolve.

This is where true independent system or network integrators come in. These integrators have the knowledge and experience necessary to select the products, design and install the system, and maintain it.

Well-established system integrators have more than 100 product lines from which to draw. They also have their own testing facilities that can be used to verify the manufacturer's technical specifications and interoperability with the environment into which the product will be installed.

The large monetary investment in all the equipment necessary to create such a testing facility is worth it for professional integrators if it enables the installation to go smoothly.

Selecting the right system integration partner may be a difficult decision, but it may be the last decision about your network you have to make alone.

Ingemar Sjunnemark
Executive vice-president
International sales
Glasgal Communications, Inc.
Northvale, N.J.

Letters may be edited for space and clarity.

Second Annual
Virus Research Conference

November 11-13, 1992
Hyatt Regency Crystal City
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Pre-Conference Tutorial

November 11 is a special one-day tutorial, led by Fridrik Skulason and Joe Wells. You'll see live viruses on a big screen and see how the experts analyze and disassemble them.

Examine the Facts About Viruses

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Joe Wells and Fridrik Skulason will tell us how viruses use encryption and how virus experts decrypt them.

Carl Bretteville will examine boot viruses in detail and tell us which viruses to worry about, based upon commonness and severity.

Kristen Noakes-Frye will tackle the sticky issue of virus naming.

Sandy Sorkin will teach you how to help your Help Desk.

Eli Shapira will talk about detection of new and unknown viruses.

Register Now!

Registration is simple. Just fill out and mail this form to the Virus Research Center of the ICSA, 5435 Connecticut Ave NW, Suite 33, Washington, DC 20015, along with your check made payable to ICSA. Then contact Mary Ann at 1-800-333-7424 for airfare discounts and secure your hotel room by calling the Hyatt Regency at 703-418-1234. And if you have questions, feel free to call us at 202-364-8252.

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Scoping out analyzer purchases

By MARK A. MILLER

Looking forward to the Labor Day weekend just ahead? No panic calls, a chance to sleep a little later, and a barbecue with friends, right? Well, you've still got to make it until the end of the week.

Chances are your pager could go off at 4:45 p.m. Friday, signaling a message from the help desk. Should that happen, will your thoughts of Labor Day change from a day of relaxation to a day of hard labor? Are you confident you have the tools available to quickly analyze, diagnose and restore any network problem that might greet you?

If not, you probably should be in the market for products that can ease the management headaches of today's complex internetworks. Whether you've already been looking or are just about to examine local- and wide-area network analyzers, there are numerous industry trends and buying factors that ultimately will influence your purchase.

Network know-it-alls

In the past, the analyzer marketplace was distinctly segmented into LAN and WAN tools. Today, it is quite common for vendors to offer both LAN and WAN products or incorporate both analyzer capabilities into one box.

Technology is changing as well, and analyzers are keeping up with the pace. LAN analyzers historically have served Ethernet networks, and their WAN counterparts keyed on digital leased lines, such as digital data service and T-1.

Today, token-ring and FDDI networks are quickly eroding the installed base of Ethernet systems, and requirements to analyze protocols such as ISDN and frame relay are high on the WAN manager's shopping list.

"Network managers have a difficult job," says Paul Franchois, network engineer at the National Institute of Standards and Technology in Boulder, Colo. He is one of four managers for a network with 300 on-site users plus 200 individuals in other locations.

Franchois says he works with LANs, WANs and metropolitan-area networks (MAN) — technologies that vary in transmission rate from 1M to 100M bit/sec. He deals with operating systems including DOS, Macintosh, VMS and Unix, which transmit via AppleTalk, DECnet or Transmission Control Protocol/Internet Protocol. And his Ethernet LANs connect to several remote sites via routers and 56K bit/sec or T-1 links. "In short, we must know it all," he says.

Fortunately, help is available to network managers such as Franchois who must "know it all." That help also has more

LAN and WAN protocol analyzers begin to converge for new role in distributed net management.

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LAN protocol analyzers

Company	Product	Platform	Arcnet	Ethernet Version 2	FDDI	IBM PC Network	IEEE 802.3	IEEE 802.5	LocalTalk	StarLAN	AppleTalk	DECnet	GOSIP	LAN Manager	NETBIOS	NetWare	NFS	SNA	SNMP	TCP/IP	VINES	XNS	OSI layers decoded	Tests	Distributed management	Support	Warranty (months)	Price
The AG Group, Inc. (510) 937-7900	LocalPeek, EtherPeek, TokenPeek	Mac LC, SW					✓	✓	✓		✓	✓				✓			✓	✓	✓	✓	1-7	U	R	H	3	$495-$995
Cabletron Systems, Inc. (603) 332-9400	LANView, MacLANView	Mac SE/30, II (MacLANView), PC AT (LANView)			✓			✓			✓	✓	✓		✓	✓	✓			✓	✓	✓		1-7	U	NA	B, H	3	$1,495-$11,995
Concord Communications, Inc. (508) 460-4646	Trakker	Sun Microsystems, Inc. SPARCstation	✓		✓						✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	1-7	U	S	H	6	$20,000†
CXR/Digilog, Inc. (215) 956-9570	LANVista	Kit, PC 286	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	C, R	H	12	$2,495-$6,495†
DeskNet Systems, Inc. (914) 428-7464	FDDIport	SA			✓																		1	L, U	R	H	12	$4,795-$8,595
Digital Technology, Inc. (800) 852-1252	LANHawk FDDI Network Analyzer	PC, SA			✓						✓	✓				✓			✓	✓			1-4	L, U	R	H	12	$27,000
FTP Software, Inc. (617) 246-0900	LANWatch	PC, SW	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	NA	B, H, U	3	$1,200
Hewlett-Packard Co. (Colorado Telecommunications Division) (719) 531-4000	Network Advisor	SA	✓	✓		✓	✓				✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	1-7	U	R	B, H	36	$15,000-$50,000
Intel Corp. (800) 538-3373	NetSight Analyst	PC 386, SW	✓		✓	✓	✓		✓	✓			✓	✓	✓				✓	✓		✓	1-7	NA	R	H	3	$995
	NetSight Professional	PC 386	✓			✓	✓		✓	✓	✓	✓	✓		✓		✓		✓	✓	✓	✓	1-7	U	R	B, H	36	$7,995-$8,995
Metrix Network Systems, Inc. (603) 888-7000	NetMetrix	SW (Unix)	✓	✓		✓	✓				✓	✓				✓	✓		✓	✓	✓	✓	1-7	L, U	C, R, S	B, H	3	$1,995†
M-Test Equipment (415) 882-4100	Comtest LA/Ethernet, Comtest LA/Token Ring	Kit, PC AT/XT	✓			✓	✓				✓	✓			✓	✓	✓		✓	✓	✓		2-7	U	R	B, H	12	$6,995-$8,995†
Neon Software, Inc. (510) 283-9771	NetMinder LocalTalk, NetMinder Ethernet	Mac, SW	✓			✓		✓			✓	✓				✓			✓	✓	✓		1-7	U	R	H	3	$395-$895
Network General Corp. (415) 688-2700	Expert Sniffer	Kit, PC 386	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	U	C, R	B, H, U	12	$15,500†
	Distributed Sniffer	Kit, SA	✓		✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	U	C, R	B, H, U	12	$17,985†
Novell, Inc. (408) 473-8333	LANalyzer	Kit, PC 386	✓			✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	R	B, H	12	$12,500-$19,980
Optical Data Systems, Inc. (214) 234-6400	LanVision	PC 386, SW	✓	✓	✓	✓			✓			✓				✓			✓	✓	✓	✓	1-7	U	R, S	B, H	12	$640-$3,115
ProTools, Inc. (503) 645-5400	Foundation Manager, Cornerstone Agent	PC 386, SW	✓		✓	✓	✓				✓	✓			✓	✓			✓	✓	✓	✓	1-7	L, U	S	B, H	1	$1,295 (agent), $10,995 (manager)
Tekelec, Inc. (818) 880-5656	ChameLAN 100, ChameLAN 100X	SA			✓		✓	✓			✓	✓				✓			✓	✓	✓		1-7	L, U	R	B, H	12	$29,500-$47,000
Telecommunications Techniques Corp. (301) 353-1550	NetLens 3000, NetLens 7000	Kit, PC AT, SA (NetLens 3000), PC 386DX (NetLens 7000)	✓				✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	C, R, S	H	36	$8,990-$9,995†
Triticom (612) 937-0772	LANdecoder/tr, LANdecoder/e	PC AT, SW				✓	✓								✓	✓			✓				1-7	NA	NA	H	3	$945-$1,195
Wandel & Goltermann, Inc. (919) 460-3300	DA-30, DA-31	SA	✓	✓	✓	✓	✓	✓			✓	✓	✓			✓			✓	✓	✓	✓	1-7	L, U	R	H	12	$24,000-$35,300

Key:
Platform: Kit = Hardware/software kit, Mac = Macintosh-based, PC = PC-based, SA = Stand-alone, SW = Software only
Tests: L = Library of routines, U = User-initiated
Distributed management: C = Proprietary client/server, R = Remote control/access, S = SNMP agent/manager
Support: B = Bulletin board system, H = Help line, U = User group

†Base price; additional cost for hardware interfaces, protocol interpreters, etc.

muscle than it did five years ago.

The analyzer market is being driven by two significant factors that are at opposite ends of the familiar seven-layer OSI Reference Model. At the lower layers, emerging protocols such as Fiber Distributed Data Interface, frame relay and Switched Multimegabit Data Service (SMDS) demand high-speed interfaces.

At the upper layers, client/server applications demand more complex protocol decode capabilities. Also, when LAN data is transmitted over a WAN within an internetwork, it creates additional complexities such as the need to reach LAN data embedded in an X.25 packet traveling over a frame relay network, a process known as encapsulation.

The most significant issue in the selection of a LAN or WAN analyzer, however, does not deal with protocols, but rather with the intended application of the analyzer.

Examining the need

Before beginning a search for the ideal analyzer, the intended use for that tool must be defined.

Todd Koch, a spokesman for analyzer manufacturer Tekelec, Inc., says his firm has identified three types of users that analyzers must address.

Installation specialists are concerned with cable integrity and verification of client/server applications, he says, while field service organizations want a straightforward user interface that requires little setup and configuration time. And research organizations need a tool that has extensive programming capabilities, such as the ability to simulate the network under test.

User application requirements also affect the purchase price. In many cases, the price range within one vendor's product family may vary by an order of magnitude or more. In the Buyer's Guide charts beginning on this page, prices range from a low of $395 for Neon Software, Inc.'s base NetMinder LAN analyzer to $50,000 for Ando Corp.'s high-end WAN analyzer and Hewlett-Packard Co.'s top-of-the-line LAN unit.

Several factors contribute to the price differences. First, a vendor may have products address-ing either installation, field service or research and development needs. Second, various hardware interfaces, such as Ethernet, token ring, RS-232 and V.35, may be available as extra cost options for the base unit. Third, the vendor may package and price its software in a modular fashion, typically known as protocol interpreter suites, forcing users to purchase modules on an a la carte basis.

In other words, a LAN analyzer purchased for an Ethernet running Novell, Inc.'s NetWare may be upgradable to also handle a to-

ken-ring network running Systems Network Architecture protocols. That upgrade will most likely come at an additional cost, however — one price for the token-ring interface board and another for the protocol interpreter software for SNA.

A lot in common

On the surface, LAN and WAN protocol analyzers appear to be very similar. Both tools capture a stream of high-speed LAN or WAN data and process it for the user. Both also offer a number of similar services to the user.

The ability to select the data to be captured and processed is known as filtering. A filter can be selected based upon the protocol in use or the workstation address requiring scrutiny.

For example, if a single workstation is suspected as the source of a problem, a filter could be set to only capture data to or from that workstation address. If the source of the problem was not known, the user could capture data from all workstations and then selectively display data from one workstation at a time.

Other functions to consider include the ability to detect nonstandard transmissions, such as collisions or truncated frames;

the thoroughness of the decode, usually indicated by the number of OSI layers that are processed; measurements of response times, such as the time difference between a data packet and its acknowledgement; the ability to search for a text string, such as a particular ASCII character string in the data portion of a packet; and auxiliary output, such as graphs, tables, hard copy and ASCII files.

Both LAN and WAN tools should be portable, easy to operate, and not require that the user have a Ph.D. to understand them. Beyond the common desire for ease of use, however, the two types of tools begin to diverge.

For WANs, the data being analyzed is principally transport-oriented, meaning analysis is focused largely on transmission of data through public or private net services.

LAN data is most likely an application consisting of terminal traffic or data generated by client/server applications. LAN analyzers are generally intended to be used on a desktop, while WAN analyzers are designed for an equipment closet or for use in the field.

The LAN management market

RMON to breathe new life into analyzers

As LANs grow into distributed internetworks, the ability to manage remote LAN segments and their interconnecting WAN links becomes a requirement for many network administrators.

Recognizing this need, the Internet Engineering Task Force (IETF) developed the Remote Monitoring (RMON) Management Information Base (MIB), an agent that collects network information from a remote device or segment and reports it to a management program.

But rather than spelling doom for local- and wide-area network analyzers, the RMON MIB will enable analyzers to undergo a metamorphosis. By supporting RMON, these analyzers will become remote managers that can collect data on local activity and run diagnostics for an integrated manager.

The RMON MIB is designed to operate in conjunction with the Simple Network Management Protocol and is one of the three components of IETF's network management strategy.

The first part of the IETF

management strategy is the Structure of Management Information, which describes and names the objects that will be managed. The second component is the MIB, which defines the various attributes and information regarding these objects that will be stored.

Several general types of MIBs exist: the Internet-standard MIBs, known as MIB I and MIB II; application-specific MIBs, such as token ring or Fiber Distributed Data Interface; private MIBs written by vendors that are specific to their systems; and the RMON MIB, used for distributed monitoring and analysis. The final component is SNMP, which provides the communication mechanism — or protocol — between agent and manager.

The RMON MIB is designed to address the unique requirements of distributed networks, which could have agents in any one of a number of remote devices. It further defines nine groups of objects to be managed:
■ **Statistics** — such as fragments or collisions.

■ **History** — recording statistical samples over time.
■ **Alarms** — comparing current statistics to preset thresholds.
■ **Hosts** — recording information on the active hosts.
■ **HostTopN** — reporting on hosts that are the highest in a particular statistic category.
■ **Matrix** — showing traffic between pairs of nodes.
■ **Filter** — allowing packets to be filtered by equation.
■ **Packet Capture** — providing for packet capturing.
■ **Event** — controlling the events from this device.

The RMON MIB provides great potential to the world of the protocol analyzer. With agent modules in various internetworking devices, such as hubs, bridges and servers, an analyzer equipped as a node manager may tap into a wealth of internet performance statistics. The analyzer may then be redefined as a proactive management console instead of a reactive diagnostic instrument.

— *Mark A. Miller*

WAN protocol analyzers

Company	Product	Platform	Mil-188C	RS-232	RS-422	RS-423	RS-449	RS-485	T-1	Fractional T-1	V.24/V.28	V.35	X.21	Asynchronous	Bisynchronous	DEC DDCMP	Frame relay	HDLC	ISDN	SMDS/IEEE 802.6	SNA/SDLC	SS7	X.25/X.75	OSI layers decoded	Tests (L = Library of routines, U = User-initiated)	Distributed management (C = Proprietary client/server, R = Remote control/access, S = SNMP agent/manager)	Support (B = Bulletin board system, H = Help line, U = User group)	Warranty (months)	Price
Ando Corp. (301) 294-3365	AE-5150	SA	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	1-7	L, U	C, R	H	12	$37,700-$50,000
CXR/Digilog, Inc. (408) 435-8520	WANVista, 320, 620, 841A, 900	PC 386 (WANVista), SA (others)		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-3	L, U	R	H	24	$1,995-$23,765
Digitech Industries, Inc. (203) 438-3731	900 Series	Kit, PC 386		✓	✓		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	1-4	L, U	R	H	12	$16,500
Frederick Engineering, Inc. (301) 290-9000	Feline	Kit, PC, SA	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	1-4*	U	NA	B, H	12	$1,696-$2,395†
Frontline Test Equipment (708) 653-8570	Serialtest	Mod	✓	✓	✓						✓		✓	✓		✓		✓		✓		✓	1-3	NA	R	H	12	$295-$1,495
GN Navtel, Inc. (416) 479-8090	9400 Family	PC 386, SA, SW	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-3	L, U	R	H	12	$2,000-$35,000
Hewlett-Packard Co. (Colorado Telecommunications Division) (719) 531-4000	HP 4957A, HP 4957PC, HP 4959A	PC (4959A), PC 286 (4957PC), SA (4957A)	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	1-3**	L, U	R	B, H	36	$2,990-$20,000
Hewlett Packard Co. (Idacom Telecommunications Division) (403) 462-4545	PT300/500, PT302/402	SA		✓	✓		✓		✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	1-7*	L, U	R	H	12	$16,920-$23,975
International Data Sciences, Inc. (401) 333-6200	Sherlock	PC AT/XT	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	1-7*	U	R	H	12	$1,995-$3,595
Kamputech, Inc. (908) 389-6464	KAT-1000	PC		✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-6*	U	R	H	12	$3,000-$10,000†
Network Communications Corp. (612) 844-0584	PC41 Network Probe, PC45 Network Probe, PC51 Network Probe	PC XT	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓	✓		✓		✓	1-4	L, U	R	B, H	12	$2,495-$6,495
	6620 Network Probe, 6640 Network Probe, 7050 Network Probe, 7100 Network Probe	SA	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓	✓		✓	✓	✓	1-4	L, U	R	B, H	12	$2,995-$20,000
Network General Corp. (415) 688-2700	ISDN tel/scope, LM2000, LMI Pocket Scope, CompaSS7, WAN Sniffer	Kit, PC 386 (WAN Sniffer); SA (LM2000); PC 286 (LMI Pocket Scope); PC 386 (CSS7, ISDN tel/scope)	✓	✓	✓	✓	✓				✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	1-7*	L, U	C, R	B, H, U	12	$12,500-$40,000
Prodatel Communications, Inc. (514) 689-8663	Prodatest-III	Kit, PC		✓	✓		✓				✓	✓	✓			✓		✓		✓		✓	1-3	U	R	H	12	$1,650-$4,995
RAD Data Communications, Inc. (201) 529-1100	RC-100	Mod				✓	✓	✓	✓								✓	✓					1-3	U	R	H	12	$9,995†
Tekelec, Inc. (818) 880-5656	Chameleon	SA	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-4*	L, U	R	B, H	12	$6,495-$25,000
Telecommunications Techniques Corp. (301) 353-1550	NetLens 3000	SA	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7*	L, U	R	H	36	$9,045-$10,540†
Telenex Corp./ AR Test Systems (703) 644-9000	Interview 70	Kit, PC AT	✓	✓						✓	✓			✓	✓		✓			✓		✓	1-3	L, U	R	B, H	12	$2,495-$4,995†
	Interview 8000	SA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	R	B, H	12	$14,999-$39,999
Wandel & Goltermann, Inc. (919) 460-3300	DA-30, DA-31	SA	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1-7	L, U	R	H	12	$24,000-$35,300

Platform key: Kit = Hardware/software kit; Mac = Macintosh-based; Mod = Module for PC parallel port; PC = PC-based; SA = Stand-alone; SW = Software only

* Depends on protocol under test.
** SNA to Layer 7.
† Base price; additional cost for hardware interfaces, protocol interpreters, etc.

is basically segmented into two areas: monitors and analyzers.

A typical monitor is a software utility, such as Cheyenne Software, Inc.'s Monitrix that costs several hundred to several thousand dollars. The monitor may provide statistics regarding network traffic and server loading but does not have the ability to decode LAN packets.

Other monitors, such as HP's LanProbe and Novell's LANtern, place a hardware probe on each network segment and report information on net performance and faults to a central management console. Again, protocol decoding is not part of those systems' functions.

The protocol analyzer goes far beyond the monitor in both capability and price, providing an English-language decode of the packets being transmitted. Along with this power may come a powerful price — as much as $50,000 for a full-featured unit.

There are also a number of other factors to consider that make the selection of a LAN analyzer a more complicated purchase than LAN monitors.

One of the key factors is the hardware/software platform that serves as the analyzer base. Vendors vary widely in this area, offering products such as a stand-alone unit, which is provided by the vendor as a turnkey solution; a hardware/software kit, which typically requires the user to provide an 80386-based personal computer as the analyzer host; a Unix workstation, such as a Sun SPARCstation; or a software-only analyzer designed to run on either a Macintosh or a PC.

Obviously, there are benefits and downsides to each. A PC-based analyzer can be used for tasks other than protocol analysis, while a Sun workstation will require a heftier up-front investment but provides the user with multiple windows and multitasking as well as the ability to tie into SunConnect's SunNet Manager.

In the accompanying charts, only one product, Concord Communications, Inc.'s Trakker, runs on a Sun workstation. Thirteen of the 20 vendors in the LAN analyzer chart offer products that run on PCs, while only eight provide software-only offerings.

Rodney Thayer, vice-president of R&D for Sable Technology Corp., has used FTP Software, Inc.'s LANWatch product and sees some advantages to a software-only analyzer. "Our preference is a software-only analyzer for three reasons," says Thayer. "The first is its relatively low price, second is its ability to send large volumes of captured data out of the analyzer via the network for further analysis, and third is the ability to move the analysis tool to any workstation without reconfiguring a hardware interface or placing another tap on the network."

Once buyers establish the best platform for their needs, they should examine the range of LAN interfaces supported by the product. The ability to connect to a variety of networks — such as Arcnet, Ethernet, FDDI or token ring — is a definite plus in today's mixed-vendor environments.

In the chart, only Network General Corp.'s Expert Sniffer provides complete support for the LAN interfaces listed. Most vendors offer either Ethernet or token-ring support. Among the unique interfaces covered are Arcnet, supported by Network General; NCR WaveLAN, a wireless LAN interface supported by ProTools, Inc.; and Proteon, Inc.'s ProNet 10, a proprietary 10M bit/sec token ring supported by FTP Software.

A la carte decoding

Just as the intended use of the analyzer is a major buying factor, so is the device's ability to decode protocols. LAN protocol decodes are extremely important since today the typical LAN transmits a number of protocols, such as AppleTalk, VINES, TCP/IP and SNA.

Analyzers rely on protocol interpreters to break apart a certain traffic stream in order to get at the application-layer data.

Users should carefully examine which protocol decode capabilities a vendor bundles with each unit since decode support varies so widely.

Some vendors, for instance, used to sell analyzers with one hardware interface and one protocol interpreter, and users would add protocol interpreters as needed. Now some vendors, such as Network General, bundle all the interpreters together.

But other vendors still provide a la carte selection. Some will bundle several protocol interpreters with their software and then sell others for about $600 or more per each additional interpreter.

When inquiring about support for a particular LAN operating system, such as NetWare, make sure that the analyzer supports not only that operating system, but also the particular version of that operating system, as well. The LAN operating system arena is fluctuating very rapidly with new releases almost monthly.

Consequently, there may be a development lag between an operating system release and support from the analyzer industry.

Also ask how many layers within that operating system are fully decoded. Some analyzers may encounter difficulty with application-layer protocols, which is where most network operating system (NOS) vendors make enhancements.

Many NOSes contain 300 to 400 application layer-specific packet types. They invariably add more, and the protocol analyzer may not be able to decode the data.

Another factor that should not be downplayed is ease of use. Analyzers may be menu-driven or icon-based, and may also include a library of vendor-supplied test routines. HP and Network General even supply embedded expert system analysis. The expert software contains a database of the most common problems for a given topology and protocol mixture, and assists the user by recommending or initiating tests, analyzing the results, and sug-

On September 15, a new Token Ring family will enter the

gesting possible courses of corrective action.

Peter Goldstein, network systems manager at EAC Connecting Point, a Ridgefield, Conn., systems and network integrator, has used HP's expert system-based Network Advisor to solve a complex problem with a TCP/IP network running over Ethernet.

He said a customer had experi-

A second technique is a proprietary client/server protocol, which allows the analyzer to report its results to another analyzer or console.

Four LAN analyzer vendors — CXR/Digilog, Inc., Metrix Network Systems, Inc., Network General and Telecommunications Techniques Corp. (TTC) — support this approach.

The third alternative is sup-

decision, as the intricacies of the test equipment will only be revealed after some hands-on experience.

Robert Burrell, network administrator at Ethicon, Inc., a medical supplies manufacturer in Somerville, N.J., rated vendor support as a key element in his decision to purchase Novell's LANalyzer.

Burrell uses Novell's forum on CompuServe Information Service, called NetWire, for an additional source of troubleshooting information.

Scattered pricing

Prices and warranties for LAN analyzers are all over the lot. Price factors to consider include the amount of the platform (such as an 80386 PC plus a network interface card) that the user must supply, and the price of additional interfaces and protocol interpreter suites. Extended warranties are also available from some vendors. In the chart, Neon Software's NetMinder fills the low end at $395, while some products such as Tekelec's ChameLAN 100 and HP's Network Advisor can run as high as $50,000.

It's important to note, however, that users get what they pay for. Higher end systems tend to come with support for multiple LAN interfaces and protocols. Users should also expect to pay more for a unit that supports an exotic interface, such as to an FDDI or Arcnet net.

Another factor affecting pricing is the mix of protocols supported. Users that want NetWare protocol support should expect to pay less than support for AppleTalk or VINES.

The WAN side

The second half of the internetwork testing equation is the analysis of the WAN links that tie the distributed LAN and host systems together.

WAN analyzers have come a long way since the days of bit error rate testers (BERT), which simply took a snapshot of data as it traveled over the wire. BERTs, however, do not have the ability to look inside and interpret data contained in packets. They simply confirmed that packets arrived in the necessary sequence.

Today, not only can WAN analyzers interpret data within WAN packets, but they can even perform a series of nested decode operations to get at LAN data wrapped in WAN packets.

Some of the evaluation criteria for WAN analyzers are similar to their LAN counterparts, such as a variety of platforms, prices and support options (see "Factors that may sway WAN analyzer purchases," this page).

Other selection criteria are unique, primarily distinguished

by the speed of the data transmission, type of interface and the protocols involved.

Perhaps the single greatest buying factor here are the WAN interfaces and protocol decodes supported. One example of this difference is in the testing of SMDS networks, which can pass data onto interexchange carrier networks but use IEEE 802.6 MANs to provide transmission capabilities within a relatively small area.

"One of the greatest testing challenges comes as a result of the higher data rates that new technologies, such as SMDS, provide," according to Dragos Ruiu, broadband technology manager for the IDACOM Division of HP in Edmonton, Alberta. "These rates are clearly above the capacity of humans to watch. Therefore, high-performance capture and filtering capabilities must be designed into the analyzer."

That means users should look for analyzers with adequate memory and hard-disk storage to capture data as it travels over the net, store it and play it back for analysis.

Emerging protocols, such as frame relay, SMDS and Signaling System 7 (SS7), have caught the interest of a number of WAN analyzer manufacturers. Thirteen of the 18 vendors in the WAN analyzer chart on page 40 support frame relay, while only five support SMDS. Twelve vendors provide protocol interpreters for SS7 nets.

Less frequently considered protocols are also supported, such as the International Passenger Airline Reservation System, which is decoded by Network Communications Corp., and the Global System for Mobile Communication protocol, which is analyzed by Telenex Corp.

Another significant factor on the WAN analyzer side is support for decoding encapsulated protocols.

An ancillary issue to that of protocol support is the analyzer's ability to decode a LAN protocol that has been encapsulated within a WAN frame. This encapsulation is required when, for example, a TCP/IP-based application, such as Telnet, is transmitted over a WAN link, such as X.25

Getting at encapsulated LAN data

X.25 LAP D frame (WAN) — Flag | Address | Control | Information | FCS | Flag

X.25 packet (WAN) — GFI | Logical channel group number | Logical channel number | Packet type | IP datagram

IP datagram (LAN) — IP header | TCP header | Application data

Integrated LAN/WAN analyzers must be able to perform a series of decoding operations to get at application-layer data.

FCS = Frame check sequence   GFI = General Format ID   LAP = Link Access Procedure

GRAPHIC BY SUSAN SLATER   SOURCE: DIGINET CORP., BROOMFIELD, COLO.

enced a problem for three weeks with Telnet connections from DOS workstations to a Unix host dropping mid-session.

"We captured data with the Network Advisor, and it indicated that the TCP sequence and acknowledgment numbers from the Unix host were arriving at the workstation in an incorrect order," Goldstein says. "We consulted with the host vendor, who installed a patch to its operating system and solved the problem. The Network Advisor saved us countless hours of manual network analysis time."

Part of the big picture

Over the past decade, users have witnessed and, in many cases, driven the distribution of computing power down to the end user.

Distributing computing power across an enterprise requires a company to either rely on local support staff to correct net flaws or rely on a centralized support organization. The trade-off is putting a body or a tool out at remote sites.

If the decision is made to go with a remote tool, LAN analyzers may be able to participate in a distributed network management system in one of three ways.

Most systems have the ability for remote control or remote access via dial-up connections. In some cases, auxiliary software such as Microcom, Inc.'s Carbon Copy is required to gain control of a remote PC that doubles as an analyzer.

Seventeen of the 20 vendors in the LAN analyzer chart support remote control or access of nodes in a distributed net.

port for the Simple Network Management Protocol and the Remote Monitoring (RMON) Management Information Base (MIB) (see "RMON to breathe new life into analyzers," page 39).

Only Concord Communications, Metrix Network Systems, Optical Data Systems, Inc., ProTools and TTC say they support SNMP. Remote network monitoring systems offered by HP and Novell, while not analyzers, also support the RMON MIB.

Distributed network management is a critical function for Dell Holmes, technical advisor at the Halliburton Co., an engineering services firm in Arlington, Texas. The company designed its networking strategy around a small group of experts in Arlington, which provides support to other networking centers in Houston and Seattle, as well as London and Jakarta, Indonesia.

"We have a number of protocols to deal with, including DECnet, SNA, NetWare and TCP/IP, but do not have the staff in every location that is heavily versed in all of those protocols," Holmes says. "As a result, we are considering the purchase of some type of distributed system, such as Network General's Distributed Sniffer. A distributed system that would allow the complex diagnosis to be done by our in-house experts would save us a considerable amount in travel expenses."

Another factor that generally gets less attention than it should is vendor support. Vendor services such as technical support hot lines, bulletin board systems and user support groups should be a key element of the purchase

Factors that may sway WAN analyzer purchases

Net managers would do well to consider eight key test capabilities when buying a WAN analyzer, according to Thomas Blog, founder of Progressive Computing, a subsidiary of Network General Corp:

■ **Application.** Is the tool intended for the data center? Will field engineers use it? Or is it meant to be deployed in research labs? Each of these uses has different requirements for protocol decodes, hardware interfaces and portability.

■ **Intelligent filtering.** This consists of the ability to select a specific called telephone number (for Integrated Services Digital Network voice calls) or a specific logical channel number (for X.25 data calls). Many applications will require filtering during capture and post-capture analysis.

■ **Statistics.** Specific knowledge of the network's traffic patterns.

■ **Complete decoding.** This means providing the user with a clear and detailed English-language interpretation of the protocols of interest. Requirements for emerging protocols such as frame relay or Switched Multimegabit Data Service should also be considered.

■ **Broad protocol support.** The ability to handle multiple

protocols such as X.25, ISDN, Systems Network Architecture/Synchronous Data Link Control or frame relay from multiple vendors' devices.

■ **Interfaces.** Support for the specific interfaces to be tested, such as T-1; ISDN S, T or U; RS-232; and V.35.

■ **Ease of use.** A convenient size and weight for the test environment, whether it be a desktop or equipment closet. Purchase an analyzer with a user interface that meets the needs and qualifications of the intended operators. Context-sensitive help functions and documentation clarity are also key factors.

■ **Economy of use.** The incorporation of auxiliary functions or a personal computer-based tool that can also be used for other applications. Consider the ease of upgrading the analyzer with both software decodes and hardware interfaces as new standards emerge.

The purchase of an analyzer can play a key role in the overall performance and support of a network. Clearly define your requirements before proceeding to evaluate a vendor's products. Learn how to use your analyzer and its many features thoroughly. Today's modern analyzer is a powerful net management tool.

— *Mark A. Miller*

The Telnet information, combined with the TCP and IP headers, is treated as data by the X.25 packet-layer protocol. Multiple layers of nested protocol decodes are, therefore, necessary to interpret the meaning of the Telnet data.

As with support for specific LAN protocols, the buyer should query each prospective vendor to determine if the particular combination of LAN and WAN protocols of interest are supported by that analyzer and if the vendor supports decoding of encapsulated data.

Even though most vendors say they can decode all seven protocol layers, they still have to offer decoding of encapsulated packets to be able to perform the higher level protocol decoding.

Support for encapsulated decoding is important because it allows the net manager to determine whether data is corrupted on the LAN or WAN side, which helps eliminate finger-pointing between vendors.

Price points

Like the LAN analyzer side, WAN analyzer pricing varies greatly.

In the chart, Frontline Test Equipment offered a low-end unit for $295, while systems can ramp up to a $40,000 or $50,000 price tag from Network General or Ando, respectively.

The higher end models generally support higher speed interfaces such as frame relay, Synchronous Optical Network or SMDS, and they may even come with expert system analysis. The rule of thumb is that a tester for 9.6K bit/sec links is going to cost less than a unit used for scoping activity on T-1 lines.

The multiplicity of protocols and interfaces supported in the unit is another factor that will drive up costs. WAN analyzers that can monitor and test data over several types of circuits or protocols will cost more than units dedicated to a single-speed link or protocol.

Users should also realize that vendors such as Wandel & Goltermann, Inc.'s DA-31 can command a higher price because they offer integrated LAN and WAN analysis in a single box.

The big picture

Two trends are prevalent in the analyzer community today: the incorporation of the analyzer into the bigger picture of network management and the need for analyzers that incorporate integrated LAN/MAN/WAN functionality.

The analyzer's ability to operate within the realm of standards-based network management, such as SNMP, is a key purchase criterion for Lynda Rudolph, former manager of Radiology Information Systems at Brigham & Women's Hospital in Boston. Rudolph uses Concord Communications's Trakker to manage an Ethernet network that consists of 150 nodes, seven bridged segments and one remote site via a T-1 link and Cisco Systems, Inc. routers.

"With a multivendor environment, I don't want multiple network management systems, as well," Rudolph says. "When I consider additions to our internetwork, I ask the prospective vendor for a copy of their MIB, not their management system. The Trakker understands other MIBs and allows me to incorporate all of my management functions within one tool. Should I need a protocol decode, the Trakker has those capabilities available."

In the accompanying charts, a number of other vendors are represented in both the LAN and WAN categories, including CXR/ Digilog, Hewlett-Packard, Network General, Wandel & Goltermann, TTC Telecommunications Techniques and Tekelec.

Capabilities of the products vary, as some incorporate both LAN and WAN functions into the same tool. Other vendors realize they have to address both sides of the fence so they offer separate tools to do so.

Users and vendors agree, however, that a melding of these two formerly disparate technologies is under way.

The GAN era

Nick Lombardo, product-line manager for Telenex Corp., emphasizes the transport protocols and envisions the industry moving toward the era of a so-called global-area network (GAN).

"This GAN provides a standard, end-to-end digital pipe that will carry data from workstation to workstation," Lombardo says. That means the user wants the capability to test anything in between, regardless if it is local or wide-area based.

In addition, Lombardo says rapidly evolving standards are shrinking both the product development and life cycles of test equipment.

So, while there's a lot of similarity between LAN and WAN analyzers, there also are a number of factors that buyers should consider for the local- and wide-area sides.

Over time, though, users should begin to see more integration between LAN and WAN analyzers as the technologies converge. Further, analyzers have a distinct role in distributed network management.

Eventually, they will be integrated with technologies such as SNMP to create smart agents capable of collecting and analyzing data.

The upshot is that with a little knowledge of what to look for, users can purchase tools that give them the confidence that their holidays can be salvaged, even in the event of a net outage. ∎

Miller is president of DigiNet Corp., a Broomfield, Colo.-based consulting engineering firm specializing in the design and analysis of complex internetworks. He has written a number of books, including the LAN Troubleshooting Handbook, Troubleshooting Internetworks, *and* Troubleshooting TCP/IP, *all published by M&T Books, San Mateo, Calif.*

Intel launches virus counterattack

By CHARLES BRUNO

Vendor's new LANProtect lets server act as point man for repelling viruses.

When it comes to virus protection, users have traditionally circled their wagons by outfitting LAN-attached workstations on the network perimeter with antivirus software in an effort to ward off attacks on servers.

Network managers and MIS directors often opt for that strategy because, until now, that has been the only option offered to them by vendors that have focused predominantly on supplying microcomputer software.

"The problem with that," says David Stang, director of research for the International Computer Security Association (ICSA), "is that the Indians can get through. And if the Indians happen to be viruses, all it takes is one unprotected workstation and your server is going to get scalped."

But a new class of antivirus software is emerging that shifts the virus protection paradigm from local-area network workstations to the server.

Intel Corp.'s LANProtect runs as a NetWare Loadable Module (NLM) on Novell, Inc. NetWare 3.11 servers. Stang says it represents the first of many antivirus products to protect the network server. And according to an evaluation of the product conducted by the ICSA as part of *Network World's* Network Security Test Series, the product works extremely well.

Although there are numerous antivirus products available for protecting workstations, when the ICSA tested LANProtect Version 1.0 in late June, there were no products on the market that offered server protection. Since then, Brightwork Development, Inc.'s Site-Lock and Cheyenne Software, Inc.'s Inocu-LAN have also made their way to market.

LANProtect does not simply protect the server from PC viruses; it also protects the server from Macintosh viruses, constantly checking files as they pass to and from the server.

The software lets administrators scan for viruses manually, can automatically scan the server at prescheduled intervals and can scan in real time for viruses.

When a virus is detected in a file, it is able to delete the file or move it to a protected directory where only the supervisor can access it.

Until now, users have relied on four major classes of antivirus software: checksum software (which detects changes in programs), scanners, virus removers and terminate and stay resident (TSR) programs.

"We should now revise our thinking and say there are two major classes of antivirus software: software that protects the workstation from viruses introduced from the disk drive and serial ports, and software that protects the server from the workstations and workstations from the server," Stang says. "Since we all have far more information resources on the server than the local workstation, the server protection will surely emerge as the more important of these two product classes," he adds.

Taking apart LANProtect

LANProtect consists of two main components: a stand-alone scanner and an NLM that monitors the server for viruses, prevents file viruses from being copied to or from it, and performs timed scans of the server and other activities. The scanner patrols hard disk activity at the workstation level, keeping watch for virus activity.

The NLM protects workstations from running an infected program from the server or copying infected programs to or from the server. It does not prevent the user from copying an infected file from a local drive to a local drive — such as from A: to C: — or prevent the user from running an infected program on a local drive.

"Intel feels, and we agree, that file server protection needs to be automatic, secure and not require user intervention," Stang says. Since TSRs have a high requirement for user intervention, Intel devised LANProtect so it cannot be disabled or require installa-

tion like most TSR antivirus products.

Installation

The ICSA installed the product in less than a minute by simply typing INSTALL at the A: prompt. The installation places four files in a directory called LPROTECT on the server, occupying less than 80K bytes of space. Two NLMs are copied to the SYSTEM directory: PSCAN.NLM and LPRO-TECT.NLM.

The installation is simple because the user is asked for little information, and intelligent defaults are provided, permitting the person to use a carriage return to move to the next question. The user is asked whether the source drive is correct, the default installation of F:LPROTECT is acceptable and the person wishes to install it. The user is also asked if he wishes to install the NLM. If so, the NLMs are copied to the SYSTEM directory; if not, they are copied to the LPRO-TECT directory.

Upon installation, the user is told that to run LANProtect, he must start it from the server console by typing LOAD LPRO-TECT.NLM. Doing so produces a screen that looks identical to the screens of other NetWare system programs, with the options: Start manual scan, Monitor, Configuration, Utilities and Security.

In summary, the ICSA found

the product easy to install. According to Stang, installation instructions are clear, accurate and useful. Also, messages appearing during installation are informative.

Stang and his staff then tried to install the product incorrectly in order to create an error. Because they were unable to create an error, they cannot say whether errors are dealt with satisfactorily.

However, a search through the installation program on the distribution floppy disk shows that the user will be notified if either the source disk or destination directory is not found, or in the event a file cannot be read, opened or written. Because the destination directory is created automatically by the program and there is no problem if the directory already exists, the ICSA

LANProtect's response to viruses

1. LAN client attempts to access a server file.
2. LANProtect NetWare Loadable Module detects virus in file.
3. LANProtect logs infection data and blocks file access.

Server

4. LANProtect takes one of four steps:
   - Purges file
   - Moves to a quarantined directory
   - Renames file
   - Leaves unchanged

SOURCE: INTERNATIONAL COMPUTER SECURITY ASSOCIATION, WASHINGTON, D.C.
GRAPHIC BY SUSAN SLATER

judged the error trapping to be excellent.

Local scanning

LPScan, which monitors workstation drives, can be instructed to scan a single drive and, within it, a single path. The path can include all subdirectories within it, or not. Multiple drives and paths can be specified on the command line for LPScan.

The product can be directed to scan any drive; therefore, a user can scan a local drive with this program. LPScan could be added

to a user menu or the start-up script on the server in order to scan the user's local storage. This will assure users that their local drives are virus-free before they log in to a server.

Real-time scanning

Another capability probed by the ICSA was the product's ability to automatically scan a file prior to when it is about to be used. Unlike local scanning, which is initiated by the user, real-time scanning is triggered when a user attempts to read a file.

The real-time monitor in the NLM can scan everything on any drive across the LAN, including workstation Drives A: through Z: if the user is logged on. Any file found to be infected will not be executed. "This design makes LANProtect possibly the most terrific antivirus concept on the market," Stang says.

He adds that some products' TSRs will also prevent execution of an infected file on local workstations, but they must be installed on each workstation. In addition, the TSRs cannot always protect the user from the actions of an infected file run from the server and can always be turned off by the user. LANProtect, by contrast, is installed on the server, protects against infected files run from any drive and cannot be turned off by the user.

Most antivirus products include a scanner that can be used on the server or workstation, but these products are activated manually or, in some cases, at timed intervals.

In the period between scanning and running a given program, a virus could infect the system and escape detection until the next scan. LANProtect's real-time monitoring ensures that scanning is always done just before a file is executed.

By offering real-time monitoring in which an infected program cannot be run, LANProtect prevents the Stealth virus from becoming memory-resident and using any techniques to escape subsequent detection.

Because LANProtect monitors every drive in the server and in every logged-on system, network

TWISTED PAIR

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NETWORKING CAREERS

Vendor launches counterattack

continued from page 45

users are guaranteed that an infected file will never be run, providing that LANProtect is able to detect the virus in the file.

Dealing with self-infection

Aside from real-time scanning, the ICSA also explored what would happen in the event that LANProtect itself becomes infected. ICSA staffers wondered if the product could remove the virus from itself or whether it could be infected at all.

The NLMs usually reside in directories that can be accessed only by the LAN supervisor. This means, any virus in the supervisor's workstation would have these same rights. If the product were an .EXE or .COM file, it would be infectable if the supervisor logs in from a workstation infected with a memory-resident virus that LANProtect is unable to detect.

However, LANProtect is an NLM, and there are no known viruses that target NLMs. Thus, the product is uninfectable at this time. While an overwriting virus might be able to damage the NLM, as with other files that overwriting viruses can infect, the victim file would not run. Despite the absence of any NLM-specific viruses, the product is able to detect any self-infection and alert the user to what has happened.

Virus detection

LANProtect also adequately handles detection of viruses that infect master boot sectors on LAN-attached workstations.

LPScan will detect any virus on any drive when asked to scan the drive, providing it is one of the many viruses that it can detect. LANProtect can scan memory and boot sectors at the workstation, and it can scan high and low memory, depending on how the user configures it.

When the user attempts to run an infected program (after logging on), the NLM will automatically detect the virus in the file by scanning it before it is successfully opened.

Net managers can opt for one of three ways in which to set up the software to deal with viruses when they are detected. They can isolate the virus and move it to a separate directory, rename it so it is not an executable file or delete it.

Naturally, any user might wonder if LANProtect's NLM or LPScan protects the boot record or master boot record of the server. It turns out that NetWare protects them. In NetWare 3.11, these areas are completely inaccessible from the workstation. Because the user cannot access them by any method (including special utilities), neither can a virus.

This holds true for all existing boot and master boot viruses, Stang believes. Although it is possible that some future virus author will create a virus that is NetWare-aware and can somehow bypass Novell's built-in security, at present, ICSA officials believe the master boot and boot sector viruses do not threaten NetWare.

Another interesting facet of the product is that it detects a file virus in any file on a user's C: drive prior to the user running the file. However, the user must be logged in and it must be a virus that the NLM can detect.

LANProtect also can detect a memory-resident virus in a user's workstation memory at the moment it becomes resident. The NLM monitors the memory of the workstation.

Interestingly, LANProtect does not detect infections on local workstation hard disks until the file is executed. The NLM only monitors action related to the server, such as copying infected files to or from the server. Nor does the product detect a virus when an infected file is copied from a workstation's A: to C: drive.

When a file containing a virus is copied to a server directory from another server directory, from the server to the workstation or from the workstation to the server, the user will see the message, "File not found — XXX.YYY 0 files copied."

This message is displayed as if the file XXX.YYY was not found as specified by the user. The screen on the console displays the name of the virus in the file, the file name, its original location and the action taken.

Stang says his staff was unable to copy an infected file to the server with the monitor program running, providing the file was infected with one of the many viruses that LANProtect can detect.

The NLM scans all files on the drives it owns as they are opened. The ICSA ran IBM's Virscan, for instance, to scan an infected file on the server. That produced the message, "VirScan was unable to open F: WP.EXE." When an infected file is opened to be run or scanned by another product, LANProtect scans it first, detects a virus if one is present, then hides the file from the user and the user's programs, like Virscan.

The ICSA also asked whether the product can detect a virus when an infected file is run from the server. In that scenario, attempts to run any file that LANProtect identifies as containing a virus will produce the message, "Cannot execute XXX," with XXX specifying the drive, path and full file name.

An important factor in purchasing any antivirus program is whether the product uses virus names consistent with those generally used in the industry.

The names used by LANProtect are typically used by one or more other products in naming the virus. Some names are more commonly used than others, of course, while in other cases, the names used by LANProtect are not the most common.

Number of viruses detected

LANProtect missed just one of the 33 most common viruses listed by the ICSA. It passed on the Aids-2 virus, which is common in Thailand and Malaysia but uncommon in the U.S. and Europe. Upon receiving a sample of this virus from the ICSA, Intel made a correction to LANProtect so it can now detect all viruses that the association defines as common.

On a larger scale, the ICSA has its own collection of 2,187 virus samples. ICSA staffers ran LPScan against those viruses and found the program detected viruses in 2,037 of the samples for a detection rate of 93%.

In recent tests of six major workstation-based antivirus products, only one detected more from this collection, and that product does not offer the other features of LANProtect.

While LANProtect is quite good at detecting viruses, the program does not send messages to supervisors if a virus is detected. In its default mode, it automatically places any infected file in a directory named VIRUS, which is separate from the directory from which LPScan is run.

The difference in this product, however, is how the NLM protects the server. When running the NLM from the server, full server monitoring is available.

The monitor program shows information such as the number of days from the time LANProtect was last started, when the log file will be cleared and the time for the next prescheduled scan, if applicable.

It also shows the status of a real-time scan: direction of an I/O scan (incoming or outgoing), total time the I/O scan has been on, the total files scanned, the total infected files found and the action taken (moved or deleted).

It also lists the name of the last file scanned in real-time scan, whether it was being read or written, and the user's name. A final piece of information is the name of the last infected file, the virus name and the action taken. It also shows a variety of information of lesser concern to the virus fighter but of interest to the network manager, such as CPU utilization, date and time.

The logging capabilities of the product are solid, according to Stang. On a stand-alone personal computer, there is no need to track from where the virus is coming. But LANProtect is able to track network, user and workstation identification, and provide real-time reports.

LANProtect is a product for protecting the server from viruses that might otherwise come from workstations, and protecting workstations from viruses that might somehow infect them from the server. It does this job well. ⊠

Regulatory Update

continued from page 23

route or price the call.

For example, the digits can be used by universities, hospitals or hotels to give specific call handling and routing data to long-distance carriers. Similarly, corporations could use Flex ANI to decide whether to route calls onto their software-defined nets.

Mike McCullough, director of rates and tariffs at Bell Atlantic, said the carrier has not yet decided what regulatory course to take following the FCC decision. He said Bell Atlantic can either petition the FCC for reconsideration, file Flex ANI as a BSE or provide it as part of a bundled ANI service.

Customers would probably pay less for Flex ANI as a BSE in which each call would be paid for on an unbundled basis, McCullough said. But many long-distance customers do not want the service unbundled from ANI and Feature Group D service because it would require costly changes to their billing systems.

The FCC last week decided Bell Atlantic did not present sufficient showing of "hardship, equity or more effective implementation of overall policy" to justify the granting of a waiver to allow it to tariff Flex ANI as a separate, chargeable non-ONA feature of its switched access service.

"Bell Atlantic's argument that Pacific Bell tariffed its Flex ANI service differently than Ameritech is not persuasive," the FCC concluded. ⊠

AT&T to cut SDDN rates

continued from page 4

der. The carrier will also permanently reduce the $400 monthly charge to $100.

Users that cannot commit to purchasing 10 PRIs at one time can still benefit. If the customer commits to $4,800 in usage of data services accessed through PRI, AT&T will reduce the $3,000 installation charge to $500 per PRI.

"Large installation charges are what kept users away from virtual network services in the mid-1980s and have kept many users away from PRI," Langner said. "Reducing or waiving the heavy installation charge should make PRI attractive to a wider base of users."

When it introduced ISDN PRI service in 1988, AT&T charged users a $3,000 installation fee and a $400 monthly charge.

AT&T also assessed users a onetime $200 charge and 3 cents for each automatic number identification. Customers that used PRI's call-by-call service selection feature paid a onetime $250 installation charge and a $200 fee each time the access pipe was reconfigured.

In November 1989, AT&T lopped off a third of the price for phone numbers delivered with ANI and began offering call-by-call service selection free of

> "Reducing the heavy installation charge should make PRI attractive to users."

▲▲▲

charge.

In July 1991, Sprint Corp. ran a promotion under which it waived the usual $2,000 installation charge for users that signed up for its PRI service during a promotion period that ran through the end of 1991.

MCI Communications Corp. has been waiving its $3,000 ISDN PRI installation charge since 1990. ⊠

> LPScan will detect any virus on any drive when asked to scan the drive.

▲▲▲

NETWORK WORLD • AUGUST 31, 1992 **55**

SNA gets high priority

routing strategy," *NW*, Jan. 13).

Both companies' enhancements are intended to let users merge their SNA and multiprotocol backbones without sacrificing the deterministic response times SNA requires.

"My SNA response time is very, very critical to me," said Paul Dover, staff manager of communications at United Telephone Company of Florida, Inc. in Winter Park, Fla. "I've yet to take the bold step of riding our SNA traffic with our general administrative TCP/IP traffic because of the volatility of LAN-based internets. I won't consider it a viable option until [router vendors] can find a way to make SNA traffic more deterministic on router networks."

Dover is not alone.

According to a recent survey of more than 80 Fortune 500 users by Infonetics Research, Inc., a consultancy based in San Jose, Calif., more than 80% of users said they are interested in consolidating their SNA nets into a multiprotocol backbone and are

investigating that option.

But according to John McConnell, a principal at Infonetics, all of them said they would only do so if they could achieve the response times they have come to expect from SNA.

Most router vendors today have taken the tack of addressing the SNA internetworking issue by encapsulating token ring-based SNA data and Synchronous Data Link Control data in Transmission Control Protocol/Internet Protocol packets.

Crosscomm, in contrast, will not encapsulate SNA but will instead transport it across the internet using its proprietary Discovery Shortest Path First (DSP) protocol.

DSP works hand in hand with ILAN's Address Processor and Directory engine to discover the optimal routing path. The directory is a microprocessor that captures and maintains a wealth of information on up to 100,000 devices in a net. The engine looks inside the SNA packet, examines the SNA transmission priority field and routes the packet through the internet at the priority set by the network administrator.

TCP/IP encapsulation does not address the issue of SNA prioritization, meaning SNA data can be bumped in favor of a less time-sensitive file transfer, for example. What the user really needs is a router that supports traditional SNA features, according to Anura Guruge, an independent strategic consultant.

"For the first time, we're seeing a move toward a scenario where SNA traffic will be transported within an internet with some real SNA intelligence and where the router makes routing decisions based upon native SNA criteria," Guruge said.

Using the new software, the ILAN router will enable users to prioritize SNA/SDLC traffic to ensure SNA data gets through in a timely fashion even when other non-SNA local-area network packets congest wide-area network links.

With the software, the router essentially marks every packet as it goes through the network with a high, medium or low priority, which provides SNA users with a more deterministic response time. It can give SNA priority over non-SNA data and can also prioritize among different types of SNA data.

The routing decisions are made in the hardware, enabling the bridge/router to peer into each SNA packet on the fly without any perceptible degradation in performance, Guruge said.

The ILAN bridge/router with the 5.04 software will be available in October for $5,500. Upgrades for existing CrossComm customers start at $550. ▣

Users feel the fury of Andrew

ings and knocked down power lines.

Many of the hardest hit companies are still without utilities and are trying to relocate operations elsewhere.

"Other disasters pale next to this one in regard to the number of businesses affected," said John Nevola, manager of IBM's Business Recovery Services in Franklin Lakes, N.J.

More than two dozen companies declared disasters and began

Miami shore strewn with pleasure boats after Andrew's blast.

setting up computer and network operations in hot sites run by Comdisco, Inc. and IBM Business Recovery Services, according to spokespeople at those firms.

Companies several miles south of Miami took the brunt of Andrew's fury. Burger King Corp., for example, sustained heavy damage to its headquarters building, which houses 1,200 employees, and lesser damage to its data center located 12 miles north. Burger King officials said portions of its headquarters building will be inhabitable within a month. Departmental executives are now working out of temporary offices in a hotel.

By last Friday, Burger King still had not restored communications to its offices around the country, leaving those sites without electronic mail and voice mail services, which are supported out of the Florida data center. The remote offices could not upload retail sales and inventory information to Miami mainframes.

A Burger King spokesman said the company is in the process of moving computer tapes to another site and switching operations there. The spokesman said many Burger King employees had lost their homes in the storm.

Other companies in south Miami fared a bit better. Ryder Systems, Inc. shut down its data center on Sunday night and rerouted toll-free calls for truck reservations to Dallas and Omaha, Neb.

It also declared a disaster and flew 20 data processing people to a Comdisco hot site in North Bergen, N.J. However, the company never used the hot site because it was able to bring up its data center and telecommunications systems on backup power Tuesday morning.

Henry Fiallo, group director of telecommunications and MIS planning at Ryder, said the only unexpected problem he encountered was that the company's voice mail system became overloaded with unanswered messages and began to shut down. Ryder had instructed most of its employees not to come to work because there was no water pressure or power in the building and because many had lost their homes.

Electronic Data Systems Corp. (EDS), operators of the System One global travel reservation network, lost lines linking 136 travel agencies to its IBM Systems Network Architecture and Airline Link Control network. It also lost connections to British Airways and the Royal Caribbean Admiral Cruise shipping line. System One serves about 1,400 travel agencies in the Miami area using some 230 multidrop lines from Southern Bell Telephone and Telegraph Co.

The lines went down last Sunday night and still had not been restored as of Thursday of last week. The Royal Caribbean links were still out because Florida Power & Light Co. (FPL) wouldn't let carrier personnel near the Port of Miami to repair them due to downed power lines, said Libi Castano, EDS communications project specialist for System One.

Bank destruction

Some of Miami's largest banks were also knocked out by Andrew. Calls to Southeast Bank and Amerifirst Bank never went through. Barnett Banks, Inc. based in Jacksonville, Fla., lost touch with as many as 70 branches in southern Florida. Twelve of its 42 branches in Dade County remain closed, two of which were demolished, according to John DuBose, Barnett director of telecommunications.

"The only thing standing is the vault," he said.

Most of Barnett's automated teller machine operations in southern Florida, which run on a 9.6K bit/sec very small aperture terminal satellite net, are working, DuBose said. All ATMs were knocked off-line by Andrew early last Monday morning but most were brought back up Tuesday morning.

Calls that usually come into Barnett's South Miami switching center had to be rerouted to Jacksonville and Tampa, Fla., DuBose
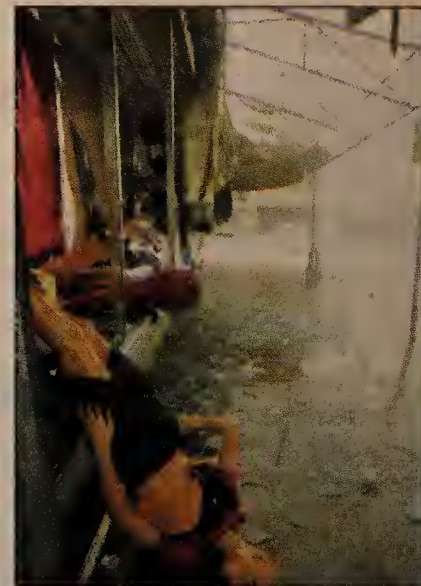
said. The bank set up additional 800 service at its Fort Lauderdale, Fla., call center, he said.

Local exchange carriers in Florida and Louisiana said tens of thousands of access lines were out of service but added that, for the most part, their network infrastructures sustained less damage than anticipated.

BellSouth Corp., whose telephone company subsidiaries serve much of southeastern Florida and Louisiana, reported 54,000 access lines out of service in Florida and 4,500 in Louisiana. United Telephone of Florida, which serves southwestern Florida, said it lost 1,100 access lines due to Andrew.

Power outages forced BellSouth to place 13 central offices in Florida and 50 central offices in Louisiana on backup power. Only one BellSouth central office, located in the devastated town of Homestead, Fla., sustained heavy damages and was knocked out of commission.

Shortly after the storm, BellSouth began staging hundreds of telephone technicians in northern Florida. These technicians entered the devastated areas late in the week after receiving clearance from FPL to help restore downed lines and hook up gener-

PHOTOS ©1992 AP/WIDE WORLD PHOTOS, INC.

Mannequin lies on its head after losing its Miami Beach home.

ators to outside concentrators. The carrier also began setting up temporary phones for people who had lost homes.

"In many areas, there are no structures left to hook into the phone network," said a BellSouth official.

McCaw Cellular Communications, Inc. and Cellular One were establishing emergency communications centers using portable cell sites for people in the hurricane-ravaged areas.

Local and long-distance carriers blocked calls into the affected areas to avoid overloading the phone system, making it tough for people to contact colleagues, family or friends. AT&T said calling volumes into the Miami area were five times higher than usual just after the storm passed. ▣

New PRI option may boost ISDN

Morristown, N.J., "PRI-SINA should go a long way in stimulating interest in ISDN. Consolidating access can generate big savings for users."

AT&T could have offered PRI-SINA earlier but decided to wait

from Teleos Communications, Inc. or an Ascend Communications, Inc. network hub paired with an AT&T Paradyne mux.

AT&T is testing to see if Northern Telecom, Inc. and other customer premises equipment can also be used with PRI-SINA.

The PBX or network hub aggregates traffic and passes it through an extended superframe

Network or Megacom services. Switched data traffic is sent to AT&T's Software-Defined Data Network, and other data is sent to AT&T's Accunet Spectrum of Digital Services.

PRI-SINA will be offered as a standard ISDN PRI feature and will carry a $150 monthly charge for M-24 multiplexing performed at the AT&T central office.

AT&T's PRI-SINA lets users consolidate access

Aggregate voice, data and video is shuttled over an ISDN PRI link to a central office, where traffic is sent to switched and dedicated services.

GRAPHIC BY SUSAN J. CHAMPENY

until technicians at its newly opened National ISDN Center could properly provision and support the access arrangement.

With PRI-SINA, users will be able to simultaneously funnel voice, local-area network and video traffic through an AT&T Definity Generic 1, 2 or 3 private branch exchange, a network hub

format channel service unit and onto a PRI link.

The PRI's 23 64K bit/sec B channels carry voice and data traffic to a digital access and cross-connect system (DACS) at an AT&T central office.

The DACS separates switched voice from data and sends it to the carrier's Software-Defined

Rod Randall, a founder of Teleos, said the company's network hubs range in price from about $9,000 to $90,000. The average regional office would need a $12,000 to $20,000 network hub, while a headquarters-sized site would need a higher end unit costing $20,000 to $40,000.

But savings from more effi-

cient use of access trunks would probably exceed the onetime cost of the equipment needed to support the access arrangement.

PRI-SINA will make the process of backing up dedicated links easier than it is now. Today, companies often buy extra dedicated access lines to back up data applications. But with PRI-SINA, excess bandwidth on the single access line can be used to support switched digital services, obviating the need for additonal access lines. The services can also be used to handle bursts of data.

AT&T began a field trial of PRI-SINA with 3M Corp. in mid-May. Switched and private network connections were established between three 3M sites over PRI lines. The links support LAN interconnection and video applications, as well as transmission of voice and X.25 data.

In the trial Teleos Network-Hubs at each site are aggregating traffic onto PRI links.

Dan Trauscht, telecommunications manager for 3M, said the company is saving money by using PRI-SINA instead of multiple dedicated access lines, but he would not give an amount.

"It's enough to make us take a hard look at using PRI in a lot of our locations," Trauscht said. "And the ability of the [Network-Hub] to sense the need for and call up additional bandwidth on the PRI is promising." ∎

Windows aims to dominate net

NOS it introduced about 2½ years ago.

Under symmetrical multiprocessing, any task can run on any one of the multiple processors concurrently, which makes the server perform better.

Windows NT will sell off the shelf with symmetric multiprocessor support for as many as 16 Intel-based processors. OEMs may customize Windows NT to their own servers.

"It's really significant if they support symmetric multiprocessing," said Jodi Mardesich, a San Francisco-based analyst with The Burton Group of Salt Lake City. "But if you have to buy a superexpensive multiprocessing machine to get good performance out of NT, it's not going to be acceptable to some people."

She pointed out that users have yet to see how Windows NT will perform on a single-processor Intel 386. Although neither company said Sequent would act as an OEM and ship Windows NT with its servers, Dwayne Walker, Microsoft's director of Windows NT and networking products, admitted that there was "more than a chance" of that happening.

"We believe Windows NT represents the best choice of [operating systems] coming from the desktop arena," said Casey Powell, president, chairman and chief executive officer for Sequent. The company will, however, continue to sell and support Unix on its servers, saying that the Windows NT server will integrate well in Unix environments.

"We've gone to great lengths to make sure that Windows is interoperable with Unix and that it works well with NetWare, IBM mainframes and so forth," Walker said.

Windows NT will offer three levels of Unix interoperability through the Transmission Control Protocol/Internet Protocol, Open Software Foundation, Inc.'s Distributed Computing Environment (DCE)-compliant remote procedure calls (RPC) and a Portable Operating System Interface (POSIX) subsystem.

"There was a time when we got a little too religious about network protocols," Walker said. Windows NT, however, will not only come standard with TCP/IP, but also be able to accept other protocol stacks from other vendors.

NetWare compatibility is another question. Microsoft and Sequent showed a Windows NT cli-

ent accessing a Windows NT server via Novell's Internetwork Packet Exchange (IPX) protocol stack, but the stack belongs to Sequent, which has licensed Novell's protocols with NetWare for Unix. Microsoft still has not formally licensed the stack.

"How or where you get your Windows NT transports will differ," Walker said. "Some will ship in the box, some will ship from Digital, but they'll be widely available from the best source."

Windows NT's DCE-complaint RPC will, in theory, allow developers creating multiplatform applications to include Windows NT servers. And Windows NT's POSIX subsystem will allow other vendors to port programming environments that run on top of Unix to run on top of Windows NT.

For example, DEC plans to port its X Window System environment, eXcursion, to Window NT, allowing Unix applications written for eXcursion to run on Windows NT.

Work group collaboration

According to sources, the company also plans to ship sometime in October its Windows for Workgroups, a version of Windows that will include peer-to-peer electronic mail, scheduling,

network-capable Dynamic Data Exchange, and file and print services. Microsoft officials previously said it would ship by year end but did not offer specifics.

The package, which alone will sell for less than $300, according to Microsoft, will also be available bundled with an Ethernet card from Intel Corp., sources said. Pricing for the bundle is not known. This is expected to be one of many bundling deals Microsoft is planning.

The company is also slated to ship in early 1993 DOS for Workgroups, which will offer the same work group capabilities to DOS users, except that it will only offer client, not peer, services. The client will allow DOS users to access files on Windows for Workgroups, Windows NT or LAN Manager computers but will not allow DOS users to share files with others on the net.

Windows for Workgroups could present a hefty challenge to established peer-to-peer network vendors such as Novell's NetWare Lite and Artisoft, Inc.'s LANtastic, analysts said. Likewise, Windows NT with multiprocessor support could challenge Novell's high-end NetWare 4.0 in enterprise LANs that need the performance for high-traffic transaction processing applications. ∎